American Druggist

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[ORIGINAL COMMUNICATION.]

THE ARCHITECTURE AND ARRANGEMENT OF DRUG-STORES.

THE following notes in regard to the store illustrated in this number will serve as a slight coloring to the artist's light and shade, probably not increasing the artistic effect, but bringing the different features of the store into slightly greater prominence. Situated on the corner of two thoroughfares; with an outlook relieved by green in summer and white in winter; in a building which attracts no little attention even in that portion of Boston noted for fine architecture; separated from the noise and dust of the street by wide sidewalks; without large stores near it to outshine it by superior attractiveness, its location is fortunate.

Over the front and side are the signs just fitting the spaces allotted by the architects of the building; the body of them covered with a dull, lemon gold-leaf, contrasting well with the dark copper-color of the raised, distinct, although somewhat peculiar letters, and matching the dull antique brass of the gas and other fixtures. Each side of the entrance, which is on Boylston street, are plate glass windows extending nearly to the sidewalk. In them are bevelled plate-glass show-cases, provided with castors, allowing cases and contents to be easily moved when windows need cleaning—a point many busy men will appreciate.* The cases protect the choicest goods from injury, and as a matter of interest connected with this series of papers, the articles used to decorate one of the windows at this time may be mentioned. A few solid silver and cut glass vinaigrettes, just sufficient in number and variety to suggest a fuller assortment inside; several toilet bottles, odd in shapes, color, or cutting; a bronze Japanese tray, several decorated ointment pots, suitable for cold cream, vaseline, etc., all placed without regular order, but with artistic effect, on cardinal plush. The wide and rather heavy door is opened with a bronze knob of cantiloupe shape. Upon entering, the harmonious colors (the general tone of which is red with a tinge of brown), the broad lines of gallery and arch, the large amount of deeply bevelled glass, the neat carving, the beautifully figured counter tops, the graceful gas-fixtures and chandelier, combine to produce an appearance of unusual richness and solidity. The wood, with the exception of show-case frames, is a selected Western cherry, finished with shellac. The floor is covered with dark, terra-cotta tiles relieved by slightly different shades. At the base of the counters is a narrow line of American black marble, while on the top is a rare African marble, whose pure white and black form a marked and pleasing contrast which attracts much attention. The extra counter in front of the prescription counter gives an opportunity to place the cashier's desk in a convenient location, besides desirable show-case and drawer room, and prevents the near approach of the public to the prescription counter; while the large glass allows weighing and general movements of the dispensers to be seen, and gives to those behind the counter an unobstructed view of the front store without the slightest suggestion of peeking.

The show-cases were made by Hughes, of Boston, of a mahogany not too dark to match the cherry, and one can scarcely imagine finer workmanship than is exhibited by them. The bevel of an inch and a half given to the glass, together with the silk plush in the cases, seem to impart an extra quality even to the goods which are shown in them. The sponge case, just in front of the prescription counter, is a way of showing sponges which is very satisfactory, as they are protected from dust and are presented to the purchaser in a much more desirable condition than when exposed in baskets. The top of the case raises from the front like a lid, and when open is supported by brass elbows at the ends. Inside partitions of plate-glass divide the case into three portions, so as to separate different varieties of sponges. The tall case on the right of the sponges is used for toilet soaps, and has a heavy glass shelf, increasing its capacity, but which scarcely shows in the engraving; swinging doors opening from the front expose the contents to the customer.

Low cases, similar to the one on the left next the counter scales, are used for nail and tooth brushes; the tooth brush case being divided by polished mahogany partitions into twenty-one spaces about four by seven inches each. The tops of the cases hinge on one side, and are supported, when open, by brass elbows. The gas fixtures do not show to advantage in the illustration on account of the photograph having been taken in summer while they were covered with gauze. They may be briefly described as follows:

* See initial letter in June number.

Curved arms spring from between two brass balls, the lower and larger mottled something like alligator skin—the upper ball of cantiloupe shape—just above the latter, a ring holds all in suspension by being caught by a hook, the shank of which extends to the ceiling. The gallery is supported by angle irons secured to the wall and by T irons which are supported on the pilasters of the lower section. The hard pine floor, which runs from face of gallery to the wall, is screwed to the T and angle irons. The gallery is panelled with cherry and the face has a four-inch moulded nosing. The closets above the gallery are not as deep as those below, thereby giving sufficient space for passage, without causing the gallery to project too far into the room. A neat brass rail, of the same dull antique finish as the gas and door fixtures, is a convenience and prevents a dangerous appearance. The arch springs from each end of the prescription counter, and was originally designed to cover a projection in the upper corner of the room, but became one of the principal decorative features; just below the centre a handsome bronze clock, in the form of a vase, has recently been placed. The prescription counter, which is under and back of the arch, is of more than usual width. It has a desk at each end, and next to each desk is a Becker scale, one for fine and the other for coarse weighing. A long row of mortars, out of the way but in easy reach, extend from scale to scale. Over the mortars, and even with the lower edge of the large glass front, is a shelf for about fifty graduates—both mortars and graduates are placed upside down to avoid dust. Under the shelf a polished brass pipe provided with five nipples and stopcocks furnish gas for Bunsen burners. Steam is introduced at one end of the counter, and may be used when more desirable than gas. The space under the counter has been carefully divided into drawers and closets for empty bottles, pots, boxes, utensils, etc., so as to bring the things in greatest demand in convenient reach. The arrangements for pasting are different from usual, and warrant a word of notice. Tinned copper paste holders are set in butternut boards which slide into the counters above the waste-paper drawers. The labels are placed directly on the boards, and the paste applied becomes so absorbent, after being washed and scraped several times a week, that a dry space on which to place a label may easily be found, even when business is brisk. The paste-brush is laid in a little trough cut in the board. The prescription counter is lighted from the front, and a window on the Berkely street side. In front of the window is the desk used for copying prescriptions and writing labels; on the left is the closet for prescription books; on the right is the closet for coated pills, which are alphabetically arranged in tin boxes open at the top and which slide in on the shelves. The front of the boxes are lettered with the kind and makers of the pills contained in them, while for convenience in examining the labels on the bottles, the sides of the boxes are only half as high.

(To be continued.)

Fresenius' Laboratory. — The laboratory of Dr. Fresenius, at Wiesbaden, during the recent winter session has been attended by 89 students, of whom 67 were Germans, 7 English, 5 Austrian, 3 American, 2 French, 2 Russian, 1 Swiss, 1 Luxemburg, and 1 Swede.

The Solubility of Camphor in water is increased by mixing tincture of myrrh with the spirit of camphor in the proportion of half a drachm to an ounce.

[ORIGINAL COMMUNICATION.]

WINDOW DECORATION.

BY F. B. KILMER, OF NEW BRUNSWICK, N. J.

EDITOR OF THE AMERICAN DRUGGIST:—Your sketches are full of interest and suggestions that are of great value in arranging and decorating druggists' windows and entrances, and yet if all were to pattern after them in detail there would be a sameness that would be far from pleasing. Their greatest value to me has been awakening of ideas, making one wonder that he never thought of that before. Some of your articles and illustrations might not be used without more expenditure than the ordinary pharmacist would care to afford, unless fitting up a new store. Still there are many points the most humble could utilize in a form modified to suit his surroundings.

It has always been a perplexing study to know what to put in the windows to fill them up; as much so, I imagine, as the "devil's" cry for "copy" in the Editor's sanctum. Many goods are greatly damaged by the exposure to light, dust, etc., especially if windows are not inclosed. I have often stopped in passing the elaborate city stores, and tried to borrow some new idea upon the subject. Sometimes I get it, at other times I do not, for there is very often a remarkable duplication of "Beef, Iron and Wine, 47c. a bott e," tired toilet soap, backed by patent medicines in faded wrappers, relieved only by "chest protectors," "insect powder," and "camphor gum" in appropriate seasons.

Your papers suggested to me a plan that is now in my window, and which can be varied to an almost unlimited extent with means at hand in any store, and the objects used can be in no way damaged. I simply placed in my window a map of the Western Hemisphere, with straight lines drawn to points, from which well-known drugs are received, at the end of each line placing a number which refer to a list placed below the map giving the name of drugs obtained from that point. Then I placed around in no particular order, specimens of roots, herbs, etc., as well as a few pharmaceutical preparations of my own manufacture made from these drugs, also pictures of plants, etc.

The map was patterned after one in NEW REMEDIES for October, 1878, adapted to such drugs as I happened to have a good specimen or picture of, and omitting any not of interest to the public.

The window never before had such an interest to passers-by, and I have heretofore spent considerable money, and many hours of labor, with but little effect comparatively.

We can also add to or take from our display without detraction. The plan is capable of almost endless changes by taking the different hemispheres, or selecting one country and exhibiting its products, or even localizing by taking one's State, and show its materia medica as far as possible by specimens and pictures. I found some odd numbers of Bentley and Trimen's "Medicinal Plants" that nicely aided in illustrating my map.

This map would be a good adjunct in utilizing your suggestion as to using cinchona bark and its alkaloids—the map to be shaded, to show sections from which the bark is derived. I find that one may fill a window full of the finest sponges, and the public will hardly bestow a glance at them, but if you put even a few coarse ones in and attach a card on them stating the coast, etc., on which they are found, and draw a line on the map pointing to the spot, they become a great curiosity. The same interest will be attached to the most ordinary root, bark, or herb. As I suggested, I think your ideas may be still farther adapted by conducting the practical operations of pharmacy in the window, such as percolation, filtration, distillation, etc. A friend of mine conducts all such on a marble-top counter in his store in full view of his customers, having for the purpose a very handsome array of porcelain and Bohemian glass apparatus. I have noticed in holiday times that the metropolitan fancy goods stores attract crowds by showing moving figures impelled by clock-work or other motive power.

Can we not steal the thunder of these arch cutters, by having something that has motion in our windows. A few neatly arranged percolators, funnels, etc., with practical work going on, will secure an audience at all times, who will gaze in wonder at seeing the menstrua enter the percolator clear and colorless, and come out in the receiving jar laden with color. And if one should put a glass retort in actual operation over a gas-stove, which could be easily arranged, he would probably have to secure the service of the police to keep the crowd away.

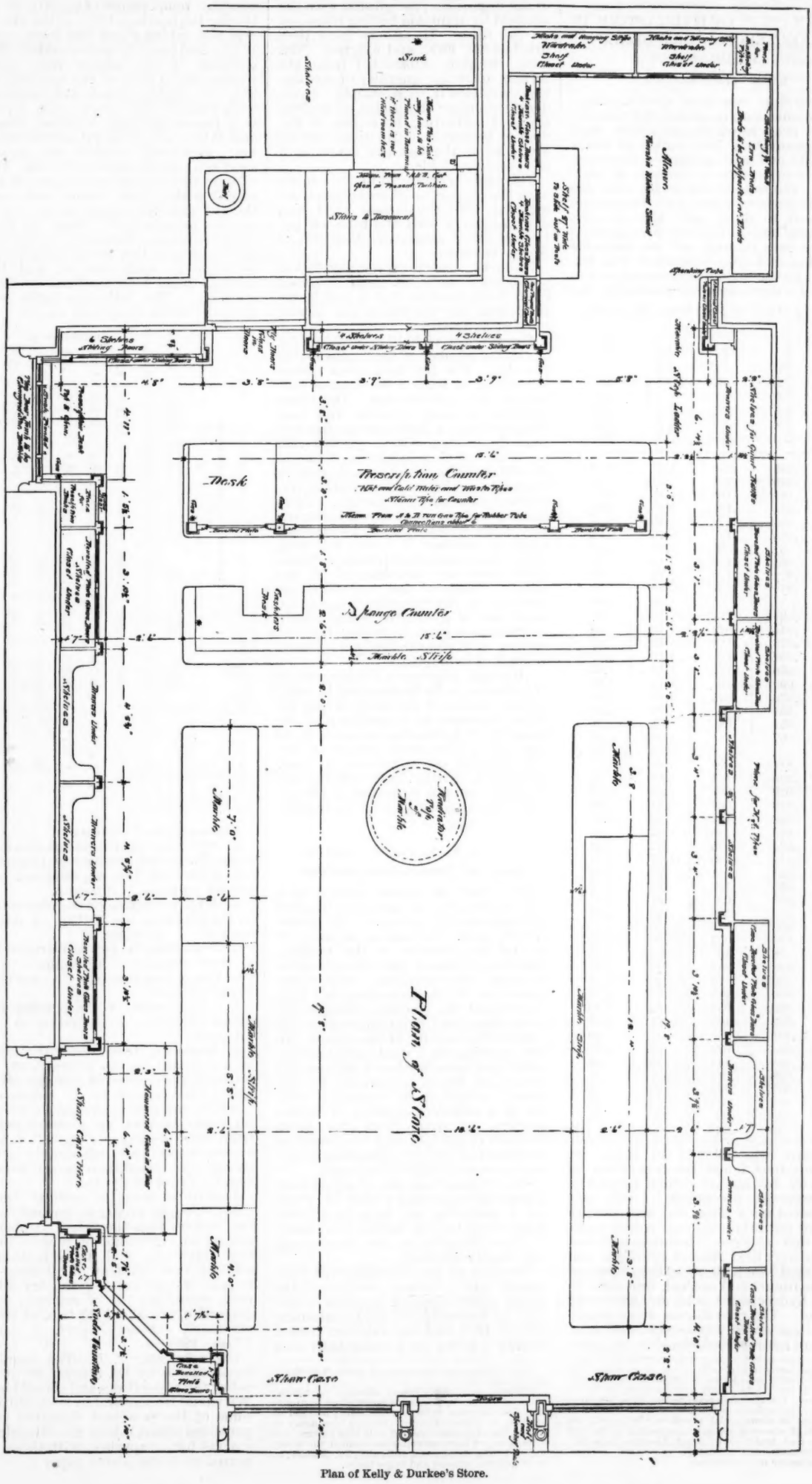
Of course, in such displays as this neatness will be of utmost importance. Fine apparatus is not necessary; old ones cleaned and polished will answer every purpose. Retort stands and other iron ware can be painted and vanished, or easily decorated with the familar bronze paints. I might also suggest that in many of our pharmaceutical journals occur illustrations that would make good window shows.

For instance, in NEW REMEDIES for November, 1879, is a picture of an ancient "apothecary." The quaint utensils, seeds, reptiles, bunches of herbs, etc., that abound in the picture could easily be found or imitated, and "ye ancient shop" would make an attractive window picture. This could be followed by a display of the utensils (coated pills, elixirs and emulsions) that characterize modern pharmacy. In the February No., 1880, is a picture of cork gathering that could be enlarged by one handy with a pencil, and form an adjunct to a display of corks. I believe attention to these matters is more pleasant and profitable than selling "patents" at cost, as it will greatly add to one's reputation, which must eventually increase the weight of his purse.

The Care of Kerosene Lamps.

SIR FREDERICK ABEL, in a lecture before the Royal Institution, gave the following suggestions for lessening, if not removing, the risk of accident which attends the use of petroleum and paraffin oil:

1. The reservoir of the lamp should be of metal, and should have no opening or feeding place in the metal.
2. The wick used should be soft and loosely plaited; it should fill the wick holder, but not so as to be compressed within the latter, and it should always be thoroughly dried before the fire when required for use. The fresh wick should be but little longer than is required to reach to the bottom of the reservoir, and should never be immersed to a less depth than about one-third the total depth of the reservoir.
3. The reservoir of the lamp should always be almost filled before use.
4. If it is desired to lower the flame of the lamp for a time, this should be carefully done, so as not to lower it beneath the metal work more than is absolutely necessary.
5. When the lamp is to be extinguished, and is not provided with an extinguishing apparatus, the flame should be lowered until there is only a flicker; the mouth should then be brought to a level with the top of the chimney, and a sharp puff of breath should be projected across the opening.


Sink
Shelving
Mirrors
Prescription Counter
Hot and Cold Water and Waste Pipes
Steam Pipes for Counter
Desk
Sponge Counter
Marble Slips
Plan of Store
Show Case
Show Case
Shelves
Drawers under
Marble
Marble Top
Marble
Marble
Marble

[ORIGINAL COMMUNICATION.]

ESTIMATION OF HYDRASTINE IN COMMERCIAL POWDERED HYDRASTIS.*

BY W. SIMONSON, PH.G.

Two fluid ounces of each tincture, representing sixty grains of hydrastis, were evaporated to one-fourth fluid ounce, one-half fluid ounce of water added, and the mixture evaporated nearly to dryness to remove all alcohol. The residue was mixed with two fluid ounces of water, and the mixture allowed to stand until the resinous matters had completely precipitated; it was then filtered, and the insoluble portion and filter exhausted with water. To the filtrate and washings was added a slight excess of ammonia; the mixture was allowed to stand for twenty-four hours for separation of impure hydrastine which formed a light-brown precipitate. This was collected on a filter, and washed with water until the washings passed tasteless and colorless. The filters and contents were next dried at 125° Fah., and weighed. Each filter was then returned to its funnel and washed, first with dilute hydrochloric acid, and then with water. The acid filtrate was a nearly colorless or very pale yellowish solution of hydrastine hydrochlorate, most of the impurities precipitated with the alkaloid by ammonia having remained on the filter. The filters were then dried at 125° Fah., and weighed. The latter weights, subtracted from the former, gave the quantity of hydrastine contained in each sample. In order to compare the yields of hydrastine and berberine, the results of Mr. Soule's berberine estimations are reproduced as the last two columns of the preceding table.

Sixty Parts of Powdered Hydrastis.

Specimen No.	Yielded of hydrastine in parts.	Equalling per cent hydrastine.	Yielded of berberine hydrochlorate in parts.	Equalling per cent berberine hydrochlorate.
1	.095	.158	1.34	2.23
2	.129	.215	1.355	2.22
3	.101	.168	1.26	2.10
4	.081	.135	1.25	2.08
5	.095	.158	1.25	2.08
6	.068	.113	1.23	2.05
7	.031	.051	1.21	2.02
8	.094	.156	1.19	1.98
9	.072	.12	1.19	1.98
10	.073	.12	1.18	1.96
†11	....	....	1.16	1.93
12	.091	.151	1.15	1.91
13	.044	.073	1.12	1.86
14	.076	.126	1.12	1.86
15	.084	.14	1.10	1.83
16	.066	.11	1.10	1.83
17	.099	.165	1.10	1.83
18	.028	.046	1.08	1.80
19	.054	.09	1.08	1.80
20	.054	.09	1.08	1.80
21	.067	.111	1.08	1.80
†22	....	....	1.08	1.80
23	.044	.073	1.05	1.75
24	.069	.115	1.04	1.73
25	.039	.065	1.04	1.73
26	.040	.066	1.01	1.68
27	.098	.163	.98	1.63
28	.070	.116	.97	1.61
29	.034	.056	.97	1.61
30	.111	.185	.97	1.61
31	.091	.151	.94	1.56
32	.063	.105	.94	1.56
33	.055	.091	.91	1.51
34	.088	.146	.90	1.50
35	.088	.146	.85	1.41
36	.032	.053	.83	1.38
37	.108	.18	.83	1.38
38	.128	.213	.79	1.31
39	.106	.176	.70	1.16
40	.129	.215	.70	1.16
41	.053	.088	.62	1.03
42	.063	.105	.61	1.01
43	.101	.168	.57	.95
44	.044	.073	.54	.90
45	.088	.146	.35	.58
46	.028	.046	.31	.51
47	.087	.145	.24	.40
48	.051	.085	.21	.35
49	.048	.08	.205	.34
50	.143	.238	....	.... ‡

The average yield of hydrastine for the entire number of specimens is .125 per cent. For the first seven (those containing at least 2 per cent of berberine), it is .143 per cent. The latter quantity is nearly identical with that obtained from a standard specimen of fresh hydrastis, which yielded .140 per cent. A close inspection of the table will show, however, that there is no fixed relation between the yield of hydrastine and that of berberine. Thus, in number 7, the quantity of berberine was forty times that of hydrastine, while in number 47 it was less than three times that of hydrastine. These proportions are corroborated by the relative yields of the two alkaloids obtained on the manufacturing scale, some lots of hydrastis being nearly worthless as regards berberine, but containing a correspondingly increased amount of hydrastine.*

Although, at present, the percentage of berberine is to be accepted in judging the quality of the drug, it may become necessary to determine also the quantity of hydrastine present, if, as appears to have been proven by the physiological investigations of Prof. Bartholow, Sattler, and others, hydrastine, and not berberine, is the peculiar active constituent of hydrastis.

HARRISON, Ohio.

* This forms a part of a series of investigations on Hydrastis canadensis conducted in the laboratory of Prof. J. U. Lloyd, and according to his direction. The tinctures operated on were prepared by Mr. Leslie Soule in estimating the berberine in samples of commercial powdered hydrastis, the results of whose investigation appeared in No. 5 of *Drugs and Medicines of North America*, page 146.

† Hydrastine not estimated.

‡ Berberine not estimated.

* See "Drugs and Medicines of North America," pp. 137 and 138.

† That is, upon quantities of albumen containing equal amounts of nitrogen, as ascertained by analysis. This appears to be the only *exact* method of arriving at correct figures. Though the assay of pepsin has often been treated of in this journal and elsewhere, we have nevertheless deemed the above paper by the well-known authority, Dr. Stutzer, to be of general interest and importance.

[ORIGINAL ABSTRACT AND TRANSLATION.]

Assay of Pepsin-Preparations.

THE effect of pepsin depends, as is well known, on its power to dissolve albuminoids in presence of hydrochloric acid. In making an assay of several dry pepsins of the market, therefore, I caused them to act, under identical circumstances, upon equal quantities of albumen-nitrogen,† then determined the albumen-nitrogen unacted upon, and from these data calculated the activity of the pepsin. In the experiments I used egg-albumen, which had been dried at + 40° and had then been finely powdered. It was found, on trial, to be completely soluble in a sufficient quantity of pepsin solution prepared from the fresh stomach of the hog, and was found, as the result of several coinciding analyses, to contain 12.45% of nitrogen.

The different samples of pepsin were dissolved by pouring ¼ liter of water on 5 grammes of each, in a liter-flask, warming for half an hour to 40° C., then filling up to the liter mark, and finally filtering.

Two Gm. of dry albumen was then placed into a beaker, 100 C.c. of the pepsin solution added, together with 2 C.c. of hydrochloric acid containing 10% of HCl, and the mixture heated during 6 hours on a water-bath at a constant temperature of exactly 40° C. During the heating, 1 C.c. of the above acid was added every half-hour, until 10 C.c. had been altogether added. The contents of the beaker were now washed into a flask of the capacity of 200 C.c., quickly cooled, and made up with water to the mark. The liquid was passed through a folded filter, and 25 C.c. of it evaporated to dryness upon previously washed and ignited sand in a capsule made of tin-foil. The capsule and contents were then cut up, mixed with a little oxalic acid, and the nitrogen determined in the usual manner by soda-lime. Since the pepsin preparations themselves contain a little nitrogen, this was separately determined in each sample, and the amount found deducted from the total quantity. The following table contains the mean analytical results:

Number of the sample. (See explanation of columns below.)	*a.* Gm.	*b.* Gm.	*c.* Gm.	*d.* Gm.	*e.* %	*f.* Gm.	*g.* Gm. of albumen.
1. "M."	0.00915	0.249	0.06468	0.05553	22.3	0.11106	0.69
2. "S."	0.00705	0.249	0.14660	0.13955	56.0	0.27910	1.74
3. "W."	0.00625	0.249	0.14445	0.13820	55.4	0.27640	1.72
4. M.	0.00990	0.249	0.03857	0.02867	11.5	0.05734	0.35
5. F.	0.00710	0.249	0.13502	0.12792	51.3	0.25584	1.60

Explanation of columns:

a. 100 C.c. of the pepsin solution contains the stated quantity of nitrogen.

b. 2 Gm. of the egg-albumen employed contains ... nitrogen.

c. After the action of the pepsin upon the albumen, the 200 C.c. of liquid contain .... nitrogen.

d. Deducting the pepsin-nitrogen (in *a*), there remains ... nitrogen.

e. The pepsin dissolves .... per cent of the albumen.

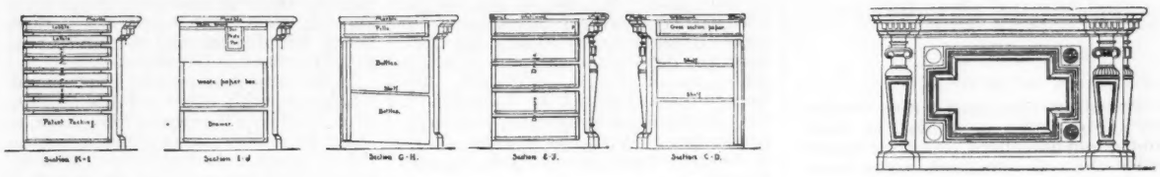
f. 1 Gm., each, of the pepsins dissolved albumen corresponding to .... nitrogen.

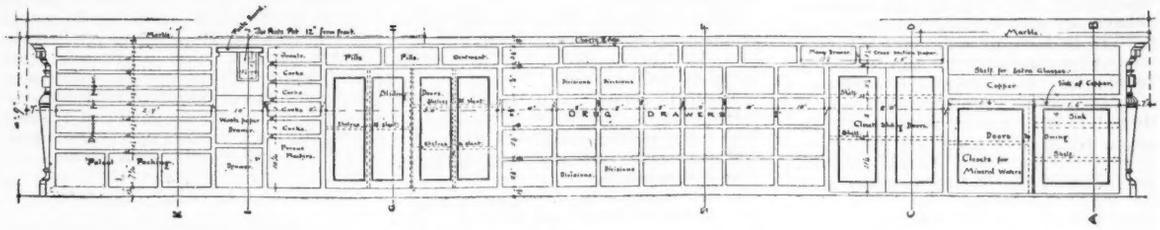
g. Assuming that pure, dry albumen contains, on an average, 16% of nitrogen, the amount of nitrogen given under *f* corresponds to ..... albumen.

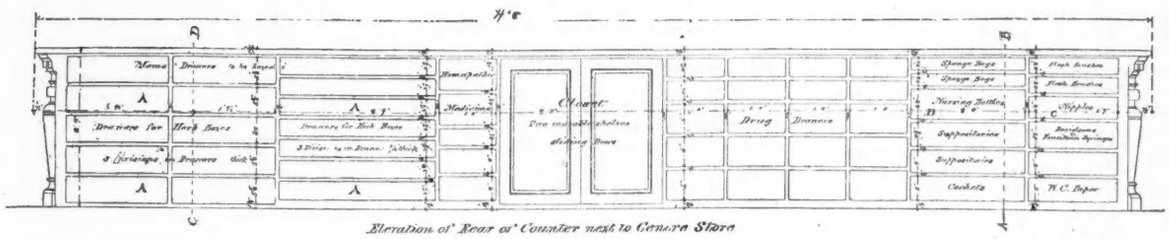
All the samples examined were from reputable makers, No. 1 and 2 being from the same firm. Nos. 2, 3, 4, and 5 were examined immediately after receipt; No. 2 had been in my possession for about two years.

Looked at from a medical standpoint, it seems proper to demand from the makers that they shall furnish a pepsin, one gramme of which, in a dry condition, shall be able to dissolve at least 0.25 Gm. of albumen-nitrogen, or 1.56 Gm. of pure, dry albumen, containing 16% of nitrogen [corresponding to about 13 Gm. of fresh albumen]. — *From Repert. d. Anal. Chem.*, 1885, 89.

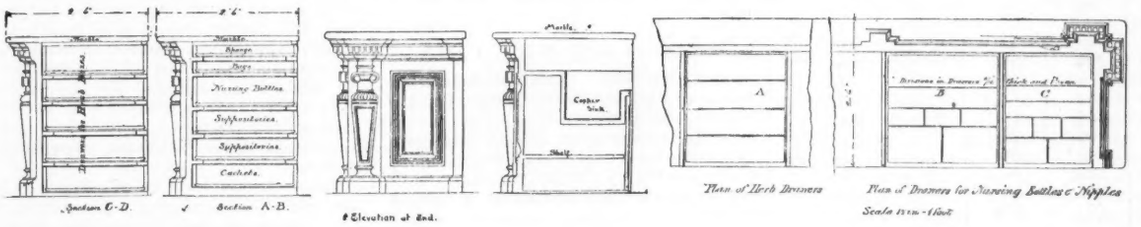
[*Note by Ed. A. D.*—The requirements made by Dr. Stutzer are much below the possibilities and actual facts. We would recommend to his attention some of the powerful digestive preparations obtainable in the American market for comparison with those reported on in the above paper.]



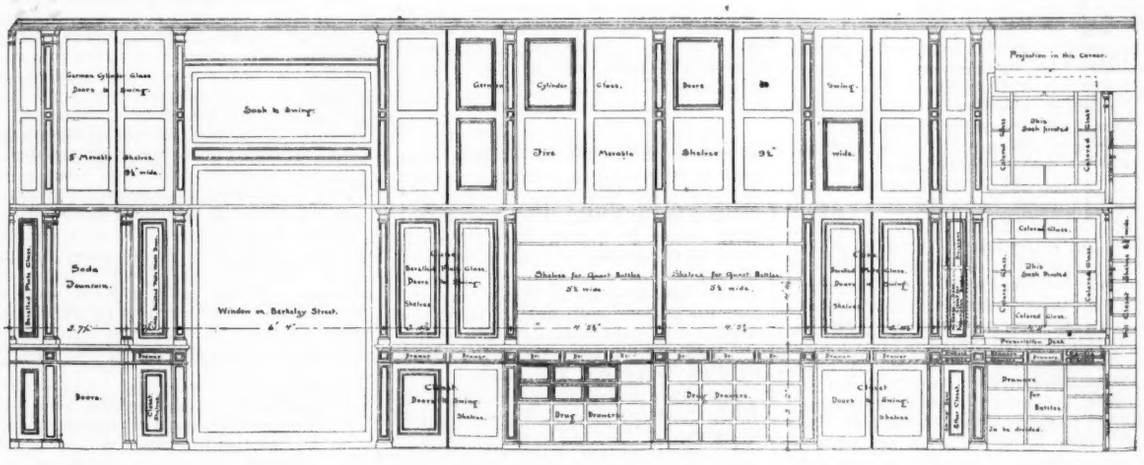


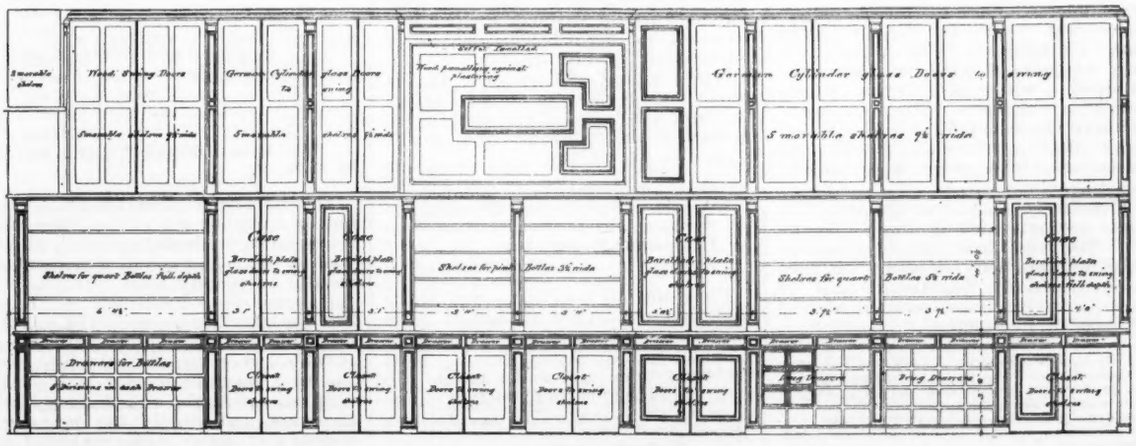


Elevation of Rear of Counter next to Canova Store



Section C-D. Section A-B. Elevation at End. Plan of Herb Drawers. Plan of Drawers for Nursing Bottles & Nipples. Scale 1½"=1 foot.





Details of counters, cases, and shelves in Kelly & Durkee's Store.

NOTES ON PRACTICAL PHARMACY.*

(Continued from page 67.)

RESIN EMULSIONS.

THESE are prepared from Venice turpentine, resin of guaiac, of jalap, and similar others. As compared with the oil emulsions, resin emulsions are but spurious emulsions.

Venice turpentine can be easily emulsified with viscid mucilaginous substances and also with yolk of egg by trituration in a mortar. For 20 Gm. it is customary to take the same amount of gum arabic, or two yolks.

Guaiac resin, finely powdered, is mixed in the mortar with half the amount of gum arabic, and under continued trituration and gradual addition of small quantities of water united with the latter. Such an emulsion is more or less bluish in color, according to its concentration, but the color gradually changes within a short time, and finally becomes greenish. In order to bring out the bluish color of the emulsion more quickly, many dispensers add a few drops of *Spiritus Ætheris*, which, however, is of but little use if it is free from acid. But as no medicinal action is exerted by the blue color, its production in receptology is only the plaything of the pedant. If time permits, the emulsion, slightly diluted with water, is exposed to the air, and the bluish color results without the admixture of any other medicinal substance.

Jalap resin is usually pounded with a few decorticated sweet almonds (two decorticated almonds for 0.5 Gm. of resin) into a light, uniform dough, which is carefully thinned with very cold water or syrup. The resin, however, soon separates even from this emulsion. If no yolk of eggs or almonds are employed as emulgents, but sugar or gum arabic instead, it is advantageous to add to the mixture about 2 Gm. of alcohol to a small quantity of resin—*e. g.*, to 2 Gm. of jalap resin—and after these are rubbed together, to incorporate some water quickly with trituration.

There are bodies which are not resins, but resemble them in their external qualities and their relations towards water, for instance, chinoidine, some other amorphous alkaloids, tannate of quinine, "quininum dulcificatum" (quinine combined with glycyrrhizin), extract of cubebs, oleoresin of male fern, etc. These substances require similar treatment as jalap resin for their suspension in water, so that they can be easily shaken up after they have been deposited. They are mixed by trituration in the mixture mortar with 3 or 4 times the amount of sugar and enough alcohol to form a thin electuary. Then the water is added with trituration. If the addition of alcohol be omitted, they form in the mixture, when at rest, a sediment which sometimes cannot be incorporated even by vigorous shaking. The addition of an equal quantity of gum arabic and the same amount of water aids in the formation of an emulsion. The above-mentioned extracts might even be mixed with five times the amount of gum arabic in order to insure their emulsification.

[Tincture of soapbark (*Quillaia*) has been recommended by the Société de Pharmacie de Paris, and other authorities, as an emulsifying agent. It may be prepared by digesting 1 part of soap bark, in coarse powder, with 5 parts of diluted alcohol.

There is, however, this objection to quillaia, that it is by no means an inert, purely emulgent substance. Its emulsifying property mainly depends upon the presence of saponin, which is quite an energetic principle, and though but little tincture of soap-bark may be required to form an emulsion, yet its use, without the express order of the physician, should not be permitted.

Mr. Joseph Ince says in *Chem. and Drug. Dairy:*

Milk makes a good emulsion with scammony, but resin of jalap will not mix with milk, while it will readily combine with almond emulsion.

Mr. Constantin (in 1854) advocated what may be called the *ignition process* for emulsifying gums and gum resins. This consists in taking a weighed quantity of *gum resin*, placing it in a mortar, and adding about four times its weight of alcohol. The alcohol is ignited, and the whole is triturated until all the alcohol is burned away. The gum resin thereby becomes a soft extract. The liquid is then added in small quantities at a time, and a perfectly homogeneous emulsion is the result.

Resins must be converted into gum-resins for this process by the addition of twice its weight of powdered gum arabic.

This method is expensive, but quite successful. The peculiar taste and odor of the drugs remain unaltered. On this process, compare NEW REM., 1876, 107.]

EMULSIONS WITH ETHERIAL OILS

do not keep long. The etherial oil, for instance, *Oleum Terebinthinæ*, is either united with a thin mucilage in a bottle by vigorous agitation, or if the prescription calls for gum arabic which is to be formed into a thick mucilage with water, or for yolk of egg, it is added thereto in a mortar gradually by agitation, and intimately mixed with it. If the quantity of the emulgent is not prescribed, take ten times as much gum as the etherial oil, or one yolk for 5 to 10 Gm. of oil.

CAMPHOR EMULSIONS.

Camphor in aqueous mixtures, or in such in which it is not completely or not at all soluble, is emulsified. If the physician has not prescribed the quantity of the emulgent, take of gum arabic ten times the amount of camphor, but only one yolk of egg for 0.2 to 5.0 Gm. of camphor. If the emulgent is left to the choice of the dispenser, gum arabic is always used. The camphor is moistened in the mixture mortar with a few drops of absolute alcohol, and rubbed to an exceedingly fine powder; this is mixed with the powdered gum arabic and emulsified by the gradual addition of small quantities of water or syrup by agitation. The powdered camphor which is kept in stock cannot be used for this purpose without further preparation, because it has lost its finely pulverulent form in the keeping.

[The simplest and quickest way of preparing *Emulsion of Oil of Turpentine* and emulsions of essential oils in general is the following (from the N. Y. and B. Formulary):

Oil of Turpentine.....	2 fl. dch.
Acacia, in fine powder.	30 grains.
Syrup....	½ fl. oz.
Cinnamon Water, to make.....	2 fl. oz.

Pour the oil into a 2 ounce bottle and, having corked it, agitate it so that the inside of the bottle may be completely wetted with the oil. Then add the acacia, and shake again. Finally add the syrup and enough cinnamon water to make 2 fl. oz., and mix thoroughly.

This emulsion will not remain long homogeneous; but, as it may be restored to its normal condition at any time by shaking, and as it keeps long enough, each time, to permit a dose being withdrawn and administered, this drawback is but slight.

In the same manner may be prepared emulsions with other volatile liquids, even such as *Ether* and *Chloroform*.

Mr. R. Rother some years ago published a paper in the *Pharmacist*, in which he laid stress upon the fact that a perfect emulsion is itself an efficient emulsifying agent, capable of taking up more of the oil, and that its power of emulsifying stopped only when the water present sank below a certain proportion. If this deficiency of water, however, is occasionally replaced, the emulsion regains its power of further emulsifying. Basing upon these facts, he gave the following process for

Emulsion of Oil of Turpentine.

Two fluidrachms of [fresh and cold-prepared] mucilage of acacia are placed into a broad, conveniently-sized mortar, and diluted with 1 fl. drachm of water. Half a fluidrachm of oil of turpentine is now added, and the whole triturated a few moments until the oil is emulsified. 1½ fl. drachms of oil are next added in ½ drachm portions, emulsifying each before adding the next. This is followed by 1 fluidrachm of water. Five fl. drachms of the oil are now introduced in the same manner as before, and again followed by ½ fl. oz. of water. After this, 3 fl. oz. of oil are again incorporated as before, and still the emulsion will retain its perfect appearance, and ever ready to extinguish quantities of oil, almost to an unlimited extent. The emulsion may afterwards be diluted with water.

General Directions for an Emulsion. Rother gives the following general directions:

Into a broad mortar of proper size introduce the emulsifying agent, which may be either already a perfect emulsion, or the yolk of egg (entirely free from albumen), but if it is gum, this must be in the form of mucilage, either thick or thin, according to the nature of the oil. Now pour on a small quantity of oil, and triturate this with the mucilage until a perfect emulsion has formed; then add the rest of the oil in small portions at a time, but not until the previous addition has been perfectly emulsified, adding small quantities of water at intervals, as the indications may require. Finally, when all the oil has been incorporated, gradually add the prescribed volume of diluent. When both a fixed and a volatile oil are prescribed in an emulsion, the fixed oil must be emulsified first before the addition of the other.]

1. ℞ Camphoræ ..	0.5 Gm.	8 gr.
Acaciæ.....	q. s.	q. s.
Aq. destillatæ	100.0 "	ad. 3½ fl. oz.
Aq. Aurantii florum,		7 fl. oz.
Syr. Althææ ää	25.0 "	5 fl. oz.

Fiat emulsio.

2. ℞ Camphoræ ..	0.5 Gm.	8 gr.
Aq. destillatæ	90.0 "	3 fl. oz.
Mucilag. Acaciæ.....	15.0 "	½ fl. oz.
Aq. Aurantii florum,		7 fl. oz.
Syr. Althææ ää	25.0 "	5 fl. oz.

M. D. S., etc.

The two prescriptions are alike. 0.5 Gm. of camphor are rubbed fine with a few drops of absolute alcohol, mixed with 5 Gm. [75 grs.] of gum arabic, emulsified readily with Syrupus Althææ, and diluted with water.

If the camphor is one of the constituents of an oil or balsam emulsion, it is rubbed very fine with absolute alcohol in a mixture mortar, mixed by trituration with the oil or balsam, then the gum and finally the necessary quantity of water, and emulsified according to the third method above given.

* The basis of this series of papers is the latest edition of Hager's "Technik der Pharmaceutischen Receptur." The editors have, however, found it desirable to omit certain portions which relate to matters of practice peculiar to Germany, and to insert others which are more characteristic of American customs. Editorial additions are inclosed in [ ].
The use of the original text has been kindly granted by Dr. Hager.

PHOSPHORUS EMULSIONS.

Owing to the powerful action of the phosphorus, this is a very important remedy in the preparation of which the greatest care should be taken. Some pharmacists recommend to melt the phosphorus in hot mucilage of acacia and then unite it therewith into an emulsion; but they lose sight of the fact that the small particles of the melted phosphorus (as in the case of wax) cohere during cooling in spite of the agitation with the pestle, form larger particles, and thus become dangerous. A phosphorus emulsion for internal use prepared in this manner must not be dispensed by the pharmacist, despite the direction of the physician. In all cases the phosphorus, dried with blotting paper, is completely dissolved in one hundred times the amount of almond or poppy-seed oil in a test tube which is repeatedly dipped into hot water; then the phosphorated cold oil is emulsified with gum and water *secundum artem*. Usually the prescription directs a similar mode of preparation.

℞ Phosphori.....	0.03 Gm.	½ gr.
Olei Amygdalæ expressi ..	q. s.	q. s.
Mucilag. Acaciæ	q. s.	q. s.
Emulsionis Amygdalæ (from 5.0).....	60.0 Gm.	ab. 2 fl. oz.
Liq. Ammon. anisati.....	0.5 "	8 min.

D. S. Teaspoonful every quarter or half hour.

The phosphorus is dissolved in 3 Gm. of almond oil (in a test-tube), the solution emulsified with 1.5 Gm. [24 gr.] of gum arabic and 2.25 Gm. (36 to 40 drops) of water, the emulsion taken up with the almond emulsion, etc.

A mixture in which float only two or three granules one-fourth the size of a pin's head may cause a fatal gastritis. *Hence caution is necessary.*

[As it is impossible to judge by the eye of the presence or absence of any solid particles of phosphorus, it is preferable to discountenance the prescribing and dispensing of phosphorus emulsions altogether, and to adopt in their place the *elixir of phosphorus* of the N. Y. and B. Formulary, the formula for which we published in our last volume, p. 128.]

WAX, CACAO BUTTER, AND SPERMACETI EMULSIONS.

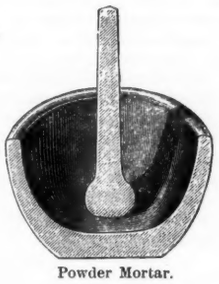
[These articles are so seldom prescribed at the present day in the form of emulsions that it is not worth while wasting space upon them. The only one which is still sometimes called for (more in England than here) is emulsion of spermaceti, which is best made with the aid of yolk of egg, thus:

℞ Spermaceti.....	2 drachms.
Yolk of Egg....	1
Syrup.....	2 fl. oz.
Water	1½ fl. oz.

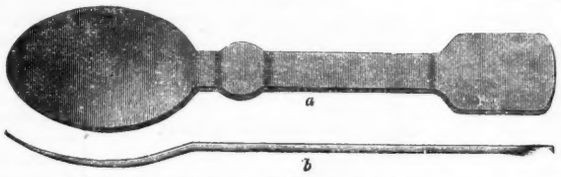
Break down the spermaceti; make it quite smooth with the syrup. Then triturate the yolk of egg, in a mortar, by a rapid circular motion, until it is smooth, gradually add the spermaceti mixture, and finally the water.]

FRESH PLANT JUICES.

Fresh plant juices, expressed juices, *succi herbarum recentes* s. *expressi*, are usually secured by means of the press, in the spring of the year, from recently collected plants such as: *Nepeta Glechoma* (ground ivy), *Fumaria officinalis* (fumitory), *Taraxacum officinale* (dandelion), *Menyanthes trifoliata* (fringe buckbean), *Achillea Millefolium* (yarrow), *Tussilago Farfara* (coltsfoot), *Chelidonium majus* (great celandine), *Anthriscus sylvestris* (wild chervil), *Anthriscus Cerefolium* (garden chervil), *Nasturtium officinale* (water cress), etc. In Germany the name of "Maisaft" (May-juice) is generally applied to the mixed juices from equal quantities of the herbs *Taraxacum officinale, Achillea Millefolium* and *Nepeta Glechoma.* For this purpose each herb is separately washed with water, if necessary cut small, crushed to a pulp in a (stone) mortar by the aid of a wooden pestle, and then expressed through a linen strainer. It is not permissible to add water in order to facilitate the expression. The freshly expressed juice is heated on the water bath to 90° C. so as to coagulate the albuminous substances, then set at rest for ten hours, when it is decanted and strained. It must not be kept for more than three days, as it is liable to spoil soon. The juice which is to be preserved for three days is filled into bottles in such a way that the tapering cork with which the bottle is stoppered displaces a part of the fluid so that the bottle is completely filled and no air bubble remains behind. Although the addition of ten per cent of glycerin will make the juice keep a few days longer, this admixture, though innocent, should not be made without the consent of the physician. It is best to add to the juice 0.33 per cent of powdered borax and effect its solution by stirring. The taste is not altered thereby and the juice will keep five or six days in a closed bottle.



Powder Mortar.



a, Large powder spoon; *b*, its form in longitudinal section.

Clarification of the juice by boiling with albumen is done only when specially directed in the prescription.

POWDER MIXTURES.

A powder is either simple or compound. Either one is required to have the proper degree of fineness and dryness, and to contain the active constituents peculiar to the substance from which it is prepared. We distinguish three grades: fine, *pulvis subtilissimus* s. *tenuissimus* s. *alcoholisatus;* moderately fine, *pulvis subtilis;* and coarse powder, *pulvis grossus.* Powder for internal use by man must be very fine, with few exceptions. Among these exceptions are, for instance, cubebs, fennel seed, anise seed, zedoary, ergot, which should be moderately fine, but not dust-like. In order to change them into dust-like powders, they would have to undergo thorough drying, whereby their medicinal qualities would, of course, be injured. In veternary practice, coarse powder must always be dispensed for the larger domestic animals.

A compound powder is prepared from several different powders, or from powders and small quantities of fluid substances, extracts, etc., by intermixture; and such a powder is to be considered perfectly and thoroughly mixed when the particles of its several constituents can be distinguished in it with difficulty by the unaided eye.

The composition and mixture of powders is on the whole one of the easiest labors of the dispenser, because the majority of the drugs ordered for this purpose are kept in stock in a finely powdered condition. The mixture is effected in a mortar whose walls have a shallow curvature and which has no spout; it is called a powder mortar. It should be large enough to contain at least ten or fifteen times the quantity of the powder to be mixed. Its pestle should not be too small: the diameter of its thick end should be about one-fourth to one-third of the transverse diameter of the upper circumference of the powder mortar, and the rubbing surface of the pestle should be parallel to the internal, rather flat bottom of the mortar. The work of mixing is done alternately, partly by friction against the bottom mortar with circular motions of the pestle, partly by strokes across the centre of the mortar through the powder, with moderate pressure. Whether the pestle is to be more or less firmly pressed down depends on the nature of the substances to be mixed. Where pulverulent substances are to be mixed, the pestle need be held and directed only with the fingers. For the trituration of hard substances it is firmly grasped with the hand.

The order in which the several constituents of the powder are placed in the morter is not fixed. It is good practice to mix the smaller quantities, which are usually the most active, first intimately with a part of the powder which is to be added in larger quantity, and when this has been done, to stir in the remainder. First weigh the powder ordered in larger quantity and which generally serves as excipient, spread a small part of it over the bottom of the mortar, put over this layer the substances ordered in smaller amounts, cover them with a little more of the excipient, and mix. Lastly add the remainder of the excipient. Powdered substances which are lumpy, or dry bodies which have to be rubbed to powder, must be thoroughly triturated in the mortar, in order to lessen the labor of mixing, before the other powders are added; for the same reason white powders are first mixed with a small quantity of a colored powder, and a very heavy one with one which is specifically lighter in order to add to this mixture again the specifically still lighter substances. If the mixture of larger quantities of powder is difficult, especially the division of one or another constituent, the mixture is passed through a moderately fine hair sieve, in order to crush the remaining coarser particles again in the mortar by themselves and add them to the sifted powder.

Dispensing Sieve.

[In order to incorporate the constituents of a compound powder thoroughly, it is best to pass each single constituent through a sieve of the required degree of fineness (the same sieve serving for all). When the whole quantity of each constituent has thus passed through, they are mixed and passed through a slightly *coarser* sieve five or six times in succession, which causes a rapid, intimate, and uniform mixture of the whole.]

For the sifting of powder mixtures in dispensing there are in use small sieves—dispensing sieves—which consist of two metallic hoops, one of which is broad (*a*), the other narrow (*c*), the latter of which fits over the former and serves for stretching gauze (bolting cloth) between them. In this way very handy and cleanly sieves are obtained which can be cleansed and freed from odors by washing, and the gauze of which can be replaced at will with-

out trouble. Of these sieves two sizes are kept, of 7 Cm. [2¾ inch.] and 10 or 11 Cm. (ab. 4 inch.) in diameter, respectively.

For removing the mixed powders from the mortar it is customary to use rather shallow spoons which are not pointed, but broadly rounded. Any powder adhering to the mortar by reason of the pressure of the pestle is scraped off with the anterior edge of the lower surface of the spoon, because the other side causes a screeching, disagreeable noise which should be avoided for the sake of propriety.

POWDER MIXTURES WITH ETHERIAL OILS.

The quantity of volatile oil is dropped upon a proportionate amount of the powder and mixed intimately therewith by trituration. Then the remainder of the powder is added.

The mixture of a volatile oil with sugar is called "oil-sugar," *elæosaccharum, ætheroleosaccharum.* If an oil-sugar is to be be mixed with larger quantities of powder, the oil-sugar is first prepared and the remaining powder added, in small portions, by degrees. Were the several constituents of the powder put at once into the mortar one after the other, the mixing would require a much longer time and it would remain questionable whether the mixture was thorough enough.

An oil-sugar is prepared from 2 Gm. of sugar and 1 drop of the volatile oil, so that the proportion by weight is 50 parts of sugar to about 1 part of volatile oil. The above proportion of one drop of oil to 2 Gm. of sugar is prescribed by the German, Austrian, Danish, Swiss, Netherlands, and Swedish pharmacopœias (1 part by weight of oil to 50 parts by weight of sugar).

If the prescription calls for no more than 1 Gm. of oil-sugar, two grammes are prepared, and half of this quantity taken, because one-half drop of oil cannot be measured.

The most frequently ordered oil-sugars are: Elæosaccharum Anisi, Aurantii florum, Citri [Limonis], Fœniculi, Macidis, Menthæ piperitæ. Then there are a few oil-sugars whose preparation is altogether different.

Oil-sugar of fresh Lemon Peel (Elæosaccharum Citri flavedinis) and oil-sugar of fresh Orange Peel (Elæosaccharum Aurantii flavedinis) are thus prepared: The rind of a fresh lemon or orange is rubbed off with a piece of sugar until the latter has absorbed a sufficient amount of volatile oil. Then the oil-soaked part of the sugar is scraped off with a knife and rubbed to powder in a lukewarm mortar. In this way the yellow part (flavedo) of a lemon or orange can be taken up with 20 Gm. of sugar in pieces (the French pharmacopœia prescribes 10 Gm. of sugar).

By Elæosaccharum Vanillæ (oil-sugar of vanilla; vanilla sugar) some physicians mean the Vanilla saccharata which is prepared by rubbing up the pith of one part of vanilla with 10 parts of sugar in pieces, or 1 part of vanilla in small pieces with 9.5 parts of sugar in pieces, sifted through a small dispensing sieve.

It is not customary to keep oil-sugars in stock. This is done only when some kind of oil-sugar is largely and frequently called for, but the stock should not last longer than ten days. Despite careful preservation in well-closed vessels in a dark place, the taste changes quite noticeably in a few days.

Powder mixtures with oil-sugar are dispensed in glass vessels or wax paper. If the powder contains carbonate of or calcined magnesia, it may also be dispensed in boxes.

POWDER MIXTURES WITH TINCTURES OR FLUIDS WHICH DISSOLVE SUGAR.

Should the fluid to be added to a sugary powder contain a very volatile constituent, the mixture should be effected without regard to the fact that the product becomes moist. If the fluid is merely a vehicle for a but slightly volatile drug, it may be allowed to evaporate with care, if it be probable that the mixture would become too damp. For instance:

℞ Tinct. Opii croc. [Vini Opii U. S.]..... gtt. 20
Sacchari albi..... 5.0 Gm.
M. f. pulv. Divide in part. æq. x.

Into a powder mortar which has been moderately warmed (by hot water poured in or by being placed on the steam apparatus) place a piece of sugar weighing about three or four grammes, drop upon it the tincture of opium, crush the sugar after a few minutes, and add the remainder of the sugar in the form of powder about five or ten minutes later. During this time enough fluid has evaporated to make the powder mixture appear dry. Nevertheless this powder is still dispensed in waxed paper.

POWDER MIXTURES WITH EXTRACTS,

especially with narcotic extracts, are very frequently called for, and it is for this reason that the German pharmacopœia contains directions for the preparation of pulverulent narcotic extracts. Two (2) parts of the official dry narcotic extract containing powdered licorice as vehicle correspond to one (1) part of the extract of pulpy consistence. The narcotic extracts of this class are: Extractum Aconiti, Belladonnæ, Conii, Digitalis, Hyoscyami, Lactucæ virosæ.

[The dry extracts of the German pharmacopœia, containing powdered licorice root as a diluent, are of no interest to American pharmacists. Of the officinal, dry extracts of the Ph. Germ., only the following are in use in this country:

Extractum Aloes.
" Cinchonæ (rarely used).
" Colocynthidis (very rarely used).
" Colocynthidis Comp.
" Hæmatoxyli.
" Nucis Vomicæ.
" Opii.
" Quassiæ (rarely used).
" Krameriæ.
" Rhei.
" Senegæ.

The commercial powdered extracts are prepared from those of a pilular consistence (or from the original drug), by mixing with sugar of milk, and careful drying. By using the so-called abstracts of the U. S. Pharmacopœia which are just twice as strong as the crude drug itself, the physician may carefully adjust the dose of the preparation or mixture. Their admixture with other substances offers no special difficulty.]

Experience has shown that extracts mixed with licorice are very slightly hygroscopic and keep permanently dry in small, well-stoppered bottles in a dry place. The Austrian, Swiss, and Netherlands pharmacopœias prepare the dry narcotic extracts with milk sugar, the Danish pharmacopœia with licorice, the Russian pharmacopœia with dextrin.

It may happen that the physian prescribes a pulpy extract in a powder mixture, and that the corresponding dry extract is not in stock, while the powder mixture contains no substances which are capable of absorbing much moisture without losing their pulverulent form. In that event the extract is weighed, mixed in a glazed porcelain mortar which has been previously heated to 50° or 60° C. with an equal weight of milk sugar or powdered licorice root, the mixture spread over the bottom of the mortar by the aid of the pestle, and placed in a moderately warm place for from one-quarter to one-half hour. With a round-pointed knife the mass is detached from the wall, the mortar is allowed to cool somewhat, and the mass triturated with pieces of sugar or with some one of the suitable constituents of the mixture to be prepared.

Among the extracts which have naturally a dry form belongs also lactucarium. This is with difficulty rubbed to powder, because it becomes electrical by friction and adheres firmly to the wall of the mortar and the pestle. Hence lactucarium must always be triturated with from two to four times the amount of sugar in pieces, or crystallized milk sugar, and whatever adheres close to the wall of the mortar must be detached with an extract knife.

As we have to expect that powder mixtures with dry extracts are liable to become moist, the divided powders are dispensed in paraffin paper. Undivided powder of this nature keeps better in pasteboard boxes than in glass vessels, in the warm season. Pasteboard boxes can be rendered indifferent to moisture by being coated on their inner surface with a melted mixture of nine parts of paraffin and one part of fluid paraffin.

POWDER MIXTURES WITH SALTS.

If salts which decompose each other are to be mixed in powder, they should not only be very dry, but finely powdered, and must be but lightly intermingled without pressure of the pestle; *e. g.*, carbonate of potassium with dry sulphate of sodium, carbonate of potassium with chloride of ammonium, nitrate of potassium with salicylate of sodium.

Effervescent Powder.—The composition of efferverscent powder is such that it is very liable to spoil, and this the more rapidly, if its components are not dry enough, or if it is preserved in imperfectly closed vessels. The powdered tartaric acid should be mixed with the sugar in a mortar previously made lukewarm by warm water, and when this is done, the finely powdered bicarbonate of sodium is lightly intermingled without any pressure of the pestle. It is not advisable to specially dry the components of effervescent powder to a temperature above 30° C. (86° F.), because the mixture afterward absorbs moisture from the air with extreme avidity.

In the warm season, effervescent powder is dispensed in paper or pasteboard boxes, and during the cold season in glass vessels.

The following table will serve for the extempore production of small quantities of effervescent powder (*Pulvis aërophorus*) of the German Pharmacopœia:

Effervesc. Powder.....	10.00	12.00	15.00	20.00	25.00
Bicarb. Sodium.....	2.63	3.16	3.95	5.26	6.58
Tartaric Acid.....	2.37	2.84	3.55	4.74	5.92
Sugar.....	5.00	6.00	7.50	10.00	12.05

Effervesc. Powder.....	30.00	35.00	40.00	45.00	50.00
Bicarb. Sodium.....	7.90	9.21	10.52	11.84	13.16
Tartaric Acid..	7.10	8.29	9.48	10.66	11.84
Sugar	15.00	17.50	20.00	22.50	25.00

Effervesc. Powder. ...	60.00	80.00	90.00	100.00	120.00
Bicarb. Sodium	15.80	21.00	23.70	26.30	31.56
Tartaric Acid..	14.20	19.00	21.30	23.70	28.44
Sugar	30.00	40.00	45.00	50.00	60.00

Seidlitz powder (pulvis aërophorus laxans), according to the direction of the German Pharmacopœia, is not generally kept in stock and always freshly prepared. [This requirement is hypercritical. We have never known Seidlitz mixture to deteriorate by keeping, unless it was exposed either to dampness or heat, or had otherwise been improperly protected.] The salts or alkaline bases are to be dispensed in colored paper, the tartaric acid in white paper.

MIXTURE OF POWDERS OF VARIOUS KINDS.

Camphor is moistened with a few drops of alcohol, rubbed to an extremely fine powder before being admixed, and then added to the remaining powder with the pestle, avoiding strong pressure, otherwise the powder adheres firmly both to the pestle and to the wall of the mortar.

A similar rule applies also to resins and bodies containing it, which manifest electrical attraction during friction, *e. g.*, Resina Guaiaci, Resina Jalapæ, Colophonium [rosin], Castoreum, Lactucarium, etc. These must have an appropriate degree of fineness, and are mixed with other powders without strong pressure of the pestle. Crystalline alkaloidal salts exhibit similar properties.

Sulphate of quinine, which is frequently dispensed in powders, likewise adheres to the walls from strong and continuous trituration, and thus causes loss to the patient. Like camphor, it must be mixed with the sugar or other constituent by gentle friction. Sulphurated antimony (antimonium sulphuratum) is usually triturated very energetically in order to bring out the color of the powder mixture; but the patient neither cares nor is it to his interest if, by reason of this pedantry, the amount of active constituents is curtailed. This preparation is so firmly rubbed into the pores of the mortar that the latter often can be cleansed only with caustic lyes and by scrubbing with sand. It is necessary that a sulphurated antimony mixture should be good, but it should always be effected by gentle pressure during trituration. [In this country, this antimony preparation has completely fallen into disuse.]

Landolt's water-bath.

Mixtures containing sulphurated antimony and calomel require that each of these substances should be mixed separately with a portion of the vehicle (sugar), and that the two mixtures be mingled by very light pressure. Inasmuch as the two substances decompose each other and form a poisonous body, too intimate mixture, and especially a moist vehicle must be avoided. To be dispensed in wax capsules.

Calomel and iodine. These two substances are mixed in a similar manner as the preceding. The vehicle is divided, and both calomel and iodine triturated separately, after which the two triturations are mixed. If calomel and iodine be mixed directly, the mixture contains at once an amount proportionate to the iodine of the two direct poisons—iodide of mercury and mercuric chloride. The effect of the powder is then also decidedly more violent or poisonous.

	Gm.	gr.
℞ Hydrargyri chloridi mitis...	0.5	8
Iodi.....	0.05	¾
Sacchari	10.0	150

M. f. pulv. Divide in 20 part. æq.

Both calomel and iodine, each separately, are mixed with 5 Gm. of sugar, and the two mixtures lightly mingled.

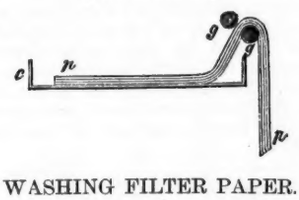
Musk. This is not kept in stock in powder, often it is not even dry enough. If triturated with powdered sugar, it is powdered with difficulty. Lumps of hard sugar should be used. For convenience there may be kept on the shelf with the musk a small stock of dry pieces of sugar, of course inclosed in a well-stoppered glass vessel or tin box. Musk powders are dispensed in paraffin paper.

When a pharmacist has found by experience that musk is occasionally prescribed by physicians for his customers, it is advisable to keep in stock Saccharated Musk (*Moschus cum Saccharo*). Musk, one part, is rubbed up with one and a half parts of milk sugar previously dried, passed through a sieve, the residue again rubbed to powder with one-half part of milk sugar and passed through the sieve. The powder, which is to be well mingled, is preserved in well-stoppered bottle and labelled: "*sumatur triplum*" [take three times the quantity ordered].

Musk in any form should be preserved in an appropriate tin box which should contain, besides a powder and a mixture mortar, each marked *Moschus*, also a small horn spoon, likewise marked *Moschus*, and at least six powder scoops for the division of powders. These appliances are used only for the dispensing of musk.

Carbonate of Magnesium and *Magnesia usta*, owing to their lightness, generally require a rather long time to cause them to mix in larger quantities with other colored powders. In order to facilitate the work, they are first intimately mixed with a small portion of a dark powder. This having been done, the mixture is placed on a smooth sheet of paper, then the other substances are mixed, and at last the magnesia mixture is added to the latter. Such powders, when pressed smooth, must not show any conspicuous white points.

(To be continued.)



WASHING FILTER PAPER.

U. KREUSSLER has devised a convenient arrangement for preparing washed filtering paper, such as is required for analytical purposes.

A flat vessel is filled with diluted hydrochloric acid, and the filtering paper, either in whole packages or sheet after sheet, is laid into it, so that half the paper hangs over the edge of the vessel. The acid is drawn over, by capillary attraction, into the outside portion of the paper, and drops from the lower edge. When the acid ceases to drop, distilled water is poured into the vessel, which will follow the same route as the acid, and gradually wash the paper until the washings cease to have an acid reaction. The arrangement is illustrated in the accompanying cut.—*Zeitsch. f. Anal. Chem.*, 1885, 81.

WATER-BATH AND HOT-FILTER COMBINED.

PROF. H. LANDOLT recommends the arrangement here illustrated. It is constructed of sheet copper, 38 *cm.* (15 inch) long and 25 *cm.* (10 inch) wide, the front portion being 9 *cm.* (3½ inch) deep, and the rear portion 11 *cm.* (4⅜ inch). The latter portion serves as water-bath, and contains several openings into which flasks, beakers, etc., may be placed, which rest upon a perforated plate elevated over the bottom of the box. The front portion has three copper-funnels soldered into it, which are destined to hold glass-funnels for hot filtrations. The size of the apparatus here shown is such as will make it suitable for analytical work only. For operations on a larger scale, it will have to be considerably enlarged. The box stands upon four legs 20 *cm.* (8 inch) high, one of which is provided with a set-screw.—*Ber. d. Deutsch. Chem. Ges.*, 1885, 56.

APPARATUS FOR THE CONCENTRATION OF VERY DILUTED SOLUTIONS.

THIS apparatus, devised by Landolt, consists of a box made of sheet-copper and standing in an inclined position, upon three legs (see cut). This box forms the water-bath, and the level of the water may be preserved at a constant level by the attachment of the well-known arrangement at *a*, described by us in NEW REM. On top of the water-bath is placed a shallow box containing a number of transverse gutters, the end of each alternate gutter being soldered to the sides, while the others stand a short distance off.

For use, the water bath box is partly filled with water and heated, the steam escaping at *c*. From a reservoir standing at a convenient height over the box, the solution to be evaporated is now allowed to flow in drops (or very fine stream) upon the upper gutter *d*, from where the liquid will gradually traverse the gutters from side to side, losing water in its descent and becoming concentrated when it reaches the outlet at *b*. As the object of the apparatus is not to evaporate any solution to dryness, but merely to concentrate it, it is necessary to permit the dense liquid to gradually run off through the tube *b*. An apparatus, 38 *cm.* (15 inch) long, 20 *cm.* (8 inch) wide, and 10 *cm.* (4 inch) high, with about 850 square *cm.* (170 square inch.) of gutter-surface, evaporated 1 liter (nearly 34 fluid ounces) of water in one hour.—*Ber. d. Deutsch. Chem. Ges.*, 1885, 56.

Landolt's concentrating apparatus.

Iodized Tannic Acid as a Reagent of Salts with Alkaline Reaction.

IF alcoholic solutions of iodine and of tannin are mixed together in equal volumes, and if two drops of the mixture are added to 20 C.c. of spring water, a rose color is produced, which disappears again in a short time. Distilled water does not give this reaction. Further experiment showed that this reaction is occasioned by all alkalies and alkaline earths, and their carbonates, bicarbonates, borates, and phosphates—in short, by all salts which have a slight alkaline reaction. If 1 part of potassium carbonate is dissolved in 100,000 parts of water, 20 C.c. of the solution gave an intense rose color with 2 drops of the reagent. Even at a dilution of 1:1,000,000 the reaction was still manifest. Sulphates and chlorides do not give this reaction; but their presence in small quantities does not interfere. The rose color is distinguishable in dilute solutions only; in strong ones it is masked by a brown color.—DR. O. SCHWEISSINGER in *Chem. News*, March 6th.

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CHAS. RICE, PH.D., ASSOCIATE EDITOR.

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EDITORIAL.

THE description of Messrs. Kelley & Durkee's store, which is commenced in this number, will be completed next month and is worthy of careful study by those who may have occasion to consider economy of space in arranging a pharmacy, as well as on account of the artistic features of the work. The arrangement of the drawers and compartments in the counters and prescription case is the result of much thought and experience. We are greatly indebted to the architects, Messrs. Sturgis and Brigham, for the loan of their working plans, and we have availed ourselves of them to illustrate many of the details of construction.

WE have received so many inquiries relating to the article on wire utensils, which we published in January, 1881, that we have thought it desirable to reproduce it on page 91, and to add illustrations of some other varieties of simple apparatus of the same general character. There is almost no limit to the variety of useful things which can be made of wire by one who possesses a little mechanical dexterity, and the models furnished by Mr. Hopkins' paper will supply material for practice.

WE ask especial attentive to what we have said on p. 92 about label-writing and will be glad, if a sufficient number of our readers desire it, to publish a paper on round-hand writing in greater detail.

THE calendar of meetings of a number of important medical societies on p. 100 has been obtained by correspondence, and will doubtless be of service to those who have goods for sale which may be of interest to physicians. The estimates of the number of persons in attendance are, we think, much below the average; in most cases many persons spending some time in the exhibitions who do not attend the meetings regularly.

Two serious mistakes in dispensing happened in the beginning of April, within a few days of each other, the first in Brooklyn, and the second one in New York City.

The facts in the Brooklyn case are briefly as follows: A prescription was presented late at night in one of the largest establishments in the city, which read as follows:

℞ Atropini sulfurici..1,5 milligrams.
Aquæ.....30 grams.
M. Use as directed.*

The person for whom the medicine was intended, was known to the dispenser as having frequently been ordered to take powerful alkaloids (such as aconitine, etc.), for neuralgia, and moreover, he had also on a previous occasion been supplied (as we are informed), with a solution of atropine for some affection of the eye. The clerk, on reading the prescription, probably thought that the mixture was to be used for a similar purpose, and in fact, there being no specific directions, he was, in our opinion, justified in coming to this conclusion. He thereupon weighed out 1 gramme and 5 milligrammes of atropine sulphate, being misled by the very unusual manner in which the quantities were stated. The usual way to order one and a half milligrammes of one ingredient, and thirty grammes of another, would be:

0.0015
30.0

the dispenser being accustomed to read the decimal fractions as grams and parts of grams. It is true that, 1.5 milligrammes is correctly written as equivalent for 1½ milligrammes, and any one unfamiliar with drugs or dispensing, but familiar with decimal fractions, would have read it correctly. However, the dispenser made an additional blunder in reading the figure 5, immediately following the decimal sign, as milligrammes after once having concluded that the 1 in front of the decimal sign denoted gramme. To be consistent, he should have read the figures 1 gramme and 5 decigrammes. But in attempting to do this, he was probably confused by the word "milligrams," which the prescriber had added. At all events, he committed the error above mentioned. Being, however, in doubt whether he should dispense such a powerful preparation merely with a label reading "use as directed," he delivered the solution in a blue poison bottle, but omitted to label it "poison."

The prescriber had intended the patient to take the whole mixture—to contain one and one-half milligrammes or about $\frac{1}{40}$ grain—at *one* dose. Instead of this, the patient took only a teaspoonful of the mixture as prepared—containing about three grains of sulphate of atropine—for a *first* dose. If he had stopped here, and could have received early medical attendance, it is quite probable that he might have recovered. It may be mentioned here, incidentally, that cases are on record where recovery took place after quantities like the following had been taken: seven and one-half grains (Machiavelli, *Gaz. Med. Lomb.* 330, 1880); four to six grains; 2 grains, etc. (see Husemann's "Pflanzenstoffe," 2d ed. 1204). While, however, already under the influence of the drug, he took another dose, with fatal result.

These are the facts, so far as they are of general interest. It cannot be denied that the dispenser committed an error in misreading the prescription, and a further error in not labelling the mixture "poison." Whether he could have ascertained, either from the physician or from the customer, how the mixture was to be used, we cannot say. We should certainly have tried to ascertain. Yet, after all, the prescriber is much more to blame than the dispenser in this case; first, for using an unusual method of designating quantities, and second, for appending such indefinite directions, in the case of such a powerful drug. It is true that there is no law compelling the prescriber to append any directions whatever, and moreover, from the standpoint of the prescriber—who wanted only $\frac{1}{40}$ grain of the alkaloid dispensed, and that taken at *one* dose—directions might have appeared superfluous. But this case shows that no precaution should be omitted *under any circumstances*, and some chance should be given to the apothecary *to assist the physician* in guarding against error, by at least affording enough information to show how the medicine is to be used. The physician who does this will be clear of all blame before the public, should the apothecary after all commit an error, and the latter will have to bear all the blame himself.

The second case is one where, unfortunately, the apothecary appears to be the only one blame. A physician had ordered an anodyne cough mixture for a child, and while the prescription was being handed to the apothecary, the latter was drawn into conversation by another customer who had an order for Dover's powders. The latter drug was delivered to the person who expected a liquid mixture for the child, and, when the apothecary's attention was drawn to the apparent discrepancy, he was so far from suspecting that he was committing an error, that he even gave directions how to mix the Dover's powder with water "to render it liquid, when it would become a liquid medicine, such as the physician had ordered." The other customer received the cough mixture intended for the other person's child. About one or two hours later, the apothecary discovered his mistake, and rushed frantically to the residence of the child, stating that an error had been committed, and using all possible means, in conjunction with the physician to save the child. All efforts, however, were fruitless, and the child died shortly afterwards.

There is no excuse possible for a mistake of this kind. To hold conversation with customers while selling fancy goods or the ordinary articles of the drug trade is quite proper and one of the features incident to the transaction. But to converse with customers while preparing prescriptions is a most serious matter, and has caused many accidents. In a well-regulated dispensing establishment, no prescription should be taken in hand for preparation, until the person handing it over the counter has received a check or other device identifying both the prescription and himself as the person entitled to it. Had this precaution been observed in this case, the accident would not have occurred.

* On the continent of Europe, it is customary to write decimal fractions with a comma (,) instead of a period (.).

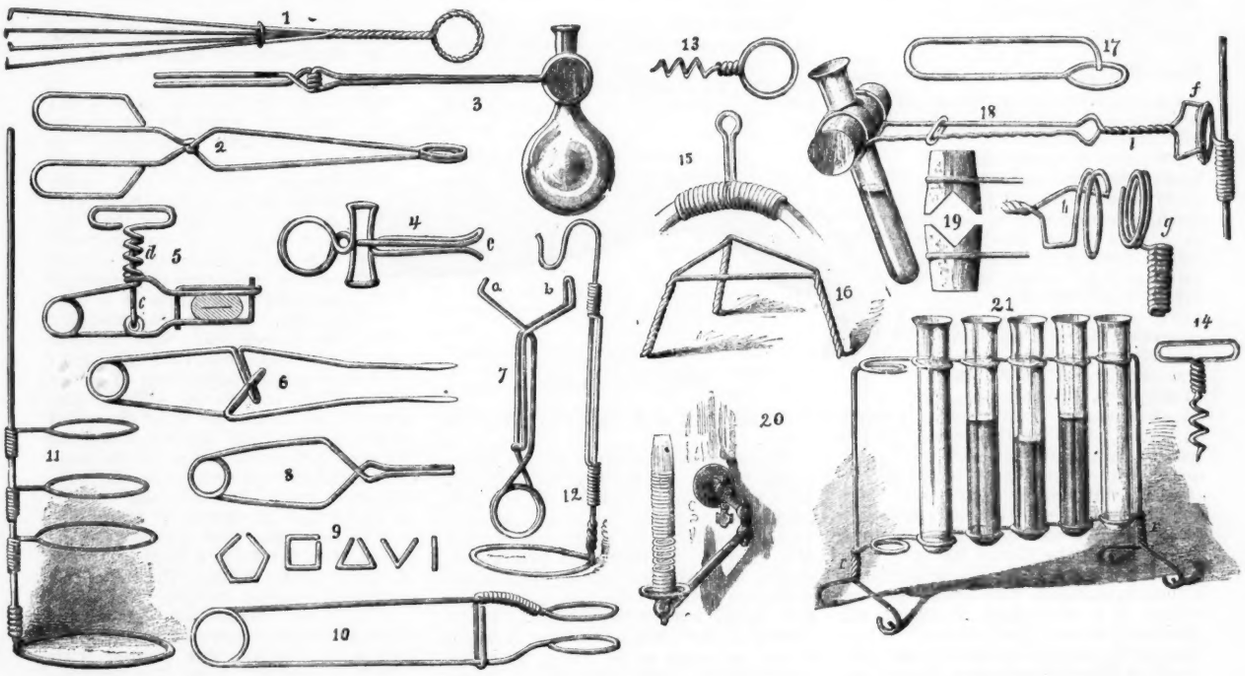
WIRE UTENSILS.

MR. GEO. M. HOPKINS describes the general construction of a variety of laboratory appliances which can often be made quite as effectual and more economical than those manufactured otherwise.

For most articles an unoxidizable wire should be selected, such as brass or tinned iron. Tinned iron wire is best for most of the utensils, as it possesses sufficient stiffness to spring well and at the same time is not so stiff as to prevent it being bent into almost any form. The tin coating, moreover, protects it from corrosion and gives it a good appearance. The necessary tools are flat and round-nosed pliers, a few cylindrical mandrels of wood or metal of different sizes, and a small bench-vice.

Fig. 1, a cork-puller, is old and well-known, but none the less useful for removing corks that have been pushed into a bottle, or for holding a cloth or or sponge for cleaning tubes, flasks, etc.

Fig. 2 is a pair of hinged tongs, useful for handling coals or a piece of pumice-stone for blow-pipe work.



When provided with notched corks, as shown in Figs. 3 and 19, is also useful for holding large test-tubes and flasks. They are made by first winding the wire of one half around the wire of the other half, to form the joint, then bending each part at right angles, forming upon one end of each half a handle and upon the other a ring. By changing the form of the ring ends, the tongs can be used for handling crucibles, cupels, etc.

Fig. 4 is a form of pinch-cock provided with thumb-pieces which are pressed in order to open the jaws.

Fig. 5 shows a clamp or pinch-cock, having a wire *c* hooked into an eye in one side, and extending through an eye formed in the other side. This wire is bent at right angles at its outer end to engage in a spiral, *d*, placed on it and acting as a screw. The open spiral is readily formed by wrapping two parallel wires on the same mandrel, and then unscrewing one from the other, the handle being afterwards formed with the aid of pliers.

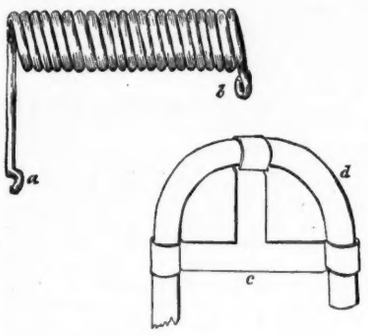
Fig. 6 represents a pair of tweezers, which should be made of good spring wire flattened at the ends.

Fig. 7 is a pinch-cock for rubber tubing; its normal position is closed, as shown, but the end *a* is capable of engaging the loop *b*, so as to hold the pinch-cock open.

Fig. 8 shows a spring-clamp for holding work to be soldered or cemented. It may also be used as a pinch-cock.

Fig. 9 shows a set of aluminium grain-weights in common use, from 1 to 5 grains, each straight side representing a grain.

Fig. 10 shows a pair of spring tongs, the extent to which they can be separated by the spring of the handle being

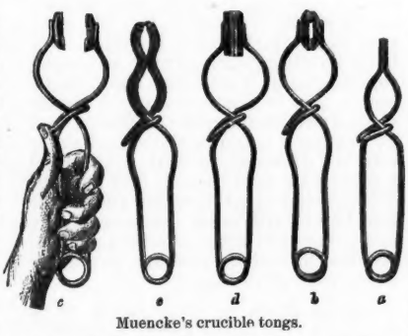


limited by the hook attached near the rings.

Fig. 11 is a stand. Should the friction of the spirals on the standard ever become so slight as to permit the rings to slip down, the spirals may be bent laterally, so as spring tightly against the standard.

Fig. 12 is a standard adjustable as to its height, for supporting the beak of a retort, or for holding glass tubes in an inclined position.

Fig. 13 and 14 represent some of the little corkscrews now made by the millions and found almost everywhere.



Muencke's crucible tongs.

Fig. 15 represents a support for flexible tubes. After the loop has been formed, the ends should be bent in opposite directions.

Fig. 16 is a tripod stand made by twisting three wires together and suitable for holding a vessel like an evaporating-dish, or sand-bath, or the charcoal used in blow-pipe work.

Fig. 17 is a clamp for holding articles to be cemented or soldered, as when cover-glasses are cemented to microscope-slides.

Fig. 18 is a test-tube holder adapted for the standard shown in Fig. 11, and capable of being turned on a peculiar joint so as to place the tube at any desired angle. The holder consists of a pair of spring-tongs having eyes for receiving the notched corks, as shown in Fig. 19. One arm of the tongs is corrugated to retain the clamping-ring in any position along the length of the tongs. The joint consists of two spirals, *g* and *h*, the spiral *h* being larger than the spiral *g*, and screwed over it, as shown in Fig. 18.

Fig. 20 shows a Bunsen-burner formed of a common burner, having a wire tube, wound in a spiral, and drawn apart near the top of the burner, to admit air, which mingles with the gas before its combustion at the top of the spiral.

Fig. 21 is a test-tube rack formed of two wires which are twisted together at *r* to form legs.—*New Remedies*, 1881, from *Sci. Amer.*

Another simple appliance not embraced in the above, which is very useful when a rubber tube is attached to a gas burner and it is desirable to prevent the tube forming a sharp angle at its connection with the burner, is a coil of wire shown in the upper figure. One end of the coil ends in an eye, *b*, the other in a straight wire terminating in a short hook, the coil is slipped over one end of the rubber tube, which is then placed on the burner, the coil is then bent so that the hook *a* can be atttached to the eye *b*, and the coil is then slipped along the tube until stopped by the burner. No amount of traction can then cause an angular bend to form at that point.

Another contrivance often used to accomplish the same purpose and which requires even less mechanical skill is the one made by cutting a

piece of metal—an old tomato can will answer—into a shape shown in the next figure (*c*), and binding the ends of the three branches so as to hold the rubber tube *d* in the manner shown.

CRUCIBLE TONGS.

TONGS for holding crucibles, dishes, and other laboratory objects are usually made in the old-fashioned way, requiring an effort of squeezing or compression to retain a hold of the object. Dr. Robert Muencke, of Berlin, now makes a series of various-sized tongs, made of stout brass-wire, which require pressure to *release* the object grasped by them. Their shape is adapted to the various utensils which they are intended to hold. Any one, who is at all handy in ordinary mechanical work, will be able to construct such tongs for his own use. *a* is a plain pair intended to hold small dishes, crucibles, or other simple objects; *e* has doubly curved jaws, which may be covered with rubber-tubing for holding test-tubes, flasks, etc.; *b*, *c*, have cheeks covered with cork for holding larger flasks or objects. Another form is *d*, where cork is replaced by rubber plates.—After *Chemiker Zeitung.*

Beef, Water, and Peptone Gelatin.

As a medium for cultivating species of bacteria, Dr. Koch uses the following mixture:

250 parts of finely chopped, lean beef are covered, in a glass vessel, with 500 parts of distilled water and set aside in a cold place (ice-box or cellar) during 24 hours. The mixture is then strained through a fourfold layer of gauze or muslin (thoroughly cleansed), and the latter slightly pressed, so that the strained liquid may amount to 400 parts. To this are added 40 parts of pure gelatin, 4 parts of pure, white meat-peptone, and 2 parts of common salt, and the whole heated at a temperature of 40° C. (104° F.) until all is dissolved. Next a concentrated solution of carbonate of sodium is slowly and cautiously added until the liquid has a faintly alkaline reaction. It is now heated in a glass flask closed with a pellet of pure cotton, in a water-bath, until all the albumin has been precipitated. When this has been ascertained by tests, the liquid is filtered through a steam-funnel into glass vessels or test-tubes, which had previously been deprived of all live organic matter by heating to 130° C. (266° F.) and had been kept closed with a plug of cotton. Sometimes it happens that the filtrate has again acquired an acid reaction. In this case, it must be again rendered faintly alkaline by soda.—E. GILLANY in *Zeitsch. Oesterr. Ap. V.*

Concentrated Solution of Iodide of Iron.

S. PLEVANI prepares a concentrated solution of ferrous iodide as follows:

Twenty Gms. of iodine and 10 Gm. of iron filings are made to react upon each other, in the usual manner, in presence of 30 Gm. of water, and the green solution of the ferrous iodide is filtered into a capsule containing 75 Gm. of glycerin. The capsule is weighed with its contents, and the latter evaporated until the contents amount to 100 parts.

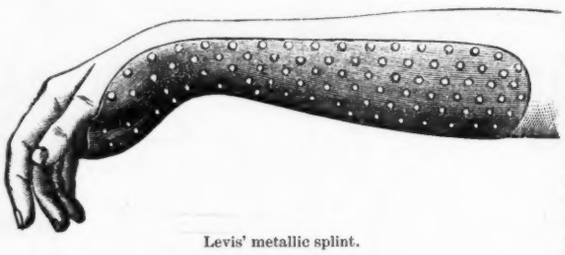
This concentrated solution of ferrous iodide in glycerin is a clear, bright-green liquid, remaining unaltered for a long time, though in daily use. As it is miscible with water, alcohol, and even to a certain extent with fatty oils, the most various pharmaceutical preparations may be made from it.—ROHDICH in *Pharm. Zeit.*

LABEL WRITING.

THE writing of labels is one of the details of drug-store work which is of minor importance, but, like the dish-washing of the household, is inevitable. Moreover, like many other things of seeming triviality, it really is worthy of very much attention, for however skilful a dispenser may be in his treatment of the contents of a package, the hand-writing on the label is the principal feature of which the non-professional buyer is capable of judging, and the comparison of a badly-written with a neatly-written label is pretty certain to impress him in favor of the dispenser who achieved the latter.

There is no style of writing which is so likely to adapt itself to the requirements of this work, and is so capable of fair results in the hands of even an indifferent penman as that known as the "round-hand." For many years this has been taught to pupils in German and French schools, and most German pharmacists are able to write it with some degree of elegance. For a long time it has been employed on the labels of Lubin's perfumes, and in this connection is quite familiar to all our readers.

Within a few years so many persons in this country have been attracted by its beauty and legibility that it has become quite popular here also, and several type-founders have produced



Levis' metallic splint.

it in all sizes and varieties for press work.

When written with a pen, it is necessary to use one with moderately stiff nibs,* and blunt, instead of pointed, and in writing, the pen is held so that instead of being at right angles with the line of writing, the pen-handle slopes towards the right. When the direction given to the pen is from the left upper corner to the right lower corner of the sheet or reverse, it forms a line as broad as the nibs; when the direction is from the right upper corner towards the left lower corner of the sheet, or reverse, the line is as thin as the thickness of the nibs. For large lettering, such as may be needed for marking packages, show-cards, etc., a pen is not necessary, a chisel-shaped stick being quite sufficient, and by cutting a notch in the edge having nibs of different breadth, the broad lines can be made double and shaded. When it is desired to render the double line letters still more ornamental, the space between these double lines can be filled in with colored ink, in oblique lines, with an ordinary pen.

𝔄 𝔅 ℭ 𝔇 𝔈 𝔉 𝔊 ℌ ℑ 𝔍 𝔎
𝔏 𝔐 𝔑 𝔒 𝔓 𝔔 ℜ 𝔖 𝔗 𝔘
𝔙 𝔚 𝔛 𝔜 ℨ

𝔞 𝔟 𝔠 𝔡 𝔢 𝔣 𝔤 𝔥 𝔦 𝔧 𝔨 𝔩 𝔪 𝔫
𝔬 𝔭 𝔮 𝔯 𝔰 𝔱 𝔲 𝔳 𝔴 𝔵 𝔶 𝔷

We append some specimens of the form of the letters which, though done with type, are precisely like those which can be rapidly executed with a proper pen. Copy-books and pens are now to be had at nearly all stationers, and it may be worth the expense and time for drug clerks to become expert in this form of writing. It certainly must increase their chances of remunerative employment.

* The best pens for this purpose are those manufactured by F. Soennecken of Bonn, the originators of the "Round Writing." Nos. 4 (coarse), and 5 (medium), will probably answer most purposes.

METALLIC SPLINTS.

WE have lately received from J. Elwood Lee, of Conshohoken, Pa., a manufacturer of surgical goods, a very handsome specimen of the metallic splint, devised by Dr. R. J. Levis, of Philadelphia, which has many commendable features. Although primarily intended for fractures of the radius, it is equally servicable as a support for the fore-arm, wrist, and hand in other cases of fracture or sprain, either to put the wrist at rest or to receive the pressure of a sling and prevent interference with the circulation of the limb. In its present modified form, it is made of nickel-plated copper, in two sizes, suitable for adults or children, and is perforated so as to render it lighter without impairing its rigidity. Any apothecary who is located in the neighborhood of a popular roller-skating rink, or a hill which is apt to be slippery in winter, may find a supply of these splints to be an active article in his stock.

Separation of Metals Precipitated by Hydrochloric Acid Lead, Silver, Mercury).

ALTHOUGH we do not expect the methods generally given for "qualitative separation" to possess a great degree of accuracy, still we look upon them as being capable of giving us some idea of the relative amounts of the ingredients in a mixture, or at any rate of indicating the presence of more than traces of a substance. It may not generally be known that the method which is almost invariably given for the separation of silver from mercurous salts by the action of ammonia on their chlorides does not even fulfil the requirements of a qualitative separation; if the mercurous chloride predominates largely, scarely a trace of silver chloride can be extracted by means of ammonia, and in any case the mercury compound always retains a large quantity of silver, as the result of the following simple experiment proves:

A mixture containing 1.183 Gm. crystals of mercurous nitrate and 0.330 Gm. silver nitrate was treated with cold hydrochloric acid. The precipitated chlorides, after being washed with boiling water, were treated for some time with cold dilute ammonia solution, then with stronger ammonia (0.96 sp. gr.); the residue was finally digested with warm ammonia.

After concentrating the ammoniacal filtrates only 0.021 Gm. of chloride of silver was obtained therefrom. The residue insoluble in ammonia gave on treatment with aqua regia 0.252 Gm. of chloride of silver.—JOSEPH BARNES in *Chem. News.*

Detection of Coal-tar Colors in Wines by means of Ammonia and Amyl Alcohol.

IN testing for coal-tar colors in wines by the ordinary method of adding ammonia to alkaline reaction and shaking with amyl alcohol, it is necessary to avoid a great excess of ammonia, and the proportion of the latter should never be more than 3 per cent; for if this is exceeded, the amyl alcohol may remain colorless, even if the wine contained a coal-tar color. If the amyl alcohol is colorless, it should be decanted off, filtered, and evaporated with a small quantity of silk, when the foreign coloring matter, if present, will become fixed on the silk.—JAY in *Bull. Soc. Chim.* and *J. Chem. Soc.*, 1885, 298.

Glycerin and its Uses.*

GLYCERIN IN TOILET PREPARATIONS.

GLYCERIN is perhaps well known to be a useful addition to the sulphur type of lotion for the hair, as the sulphide of lead which is supposed to be formed renders the hair almost as stiff as a board without some such addition.

A very recent hair-dye, and one which is said to be good, may be made by dissolving freshly-prepared ammonio-tartrate of bismuth, or the ordinary scale citrate of bismuth and ammonia, in weak glycerin, and mixing this with a solution of hyposulphite of sodium in glycerin and water, and finally diluting with more water.

Teeth-lotions have also come much into use, and of the many formulæ published the following is a type: Tincture of quillaia, eau-de-Cologne, water, borax, glycerin, with coloring. Such a combination is as excellent for its purpose as it is elegant in appearance.

Almost all cosmetic solutions are greatly improved by the addition of a little glycerin. Of these we may name freckle-lotions, zinc-oxide, and rose-water lotions, calamine lotions, etc.

Liquid starch glosses and finishes have glycerin in them as a *sine qua non*. Here is an example from the *Popular Science News:* Spermaceti, 1 oz.; gum arabic, 1; borax, 1; glycerin, 2½; water, 14½; perfume, q. s. Three spoonfuls to be added to about 4 oz. of boiling water.

Lime-juice and glycerin inseparable may easily be made by the subjoined formula, but I cannot say how much will be the percentage of glycerin. A saturated solution of borax should first be prepared. Here is a note I made a long time ago: 1 drachm of powdered borax to be dissolved in 21½ drachms of distilled water, and during solution warmed slightly to keep the temperature just a few degrees above that of a summer's day; and, to insure accuracy, it is perhaps better to weigh the materials into a large-sized 3-oz. bottle. The oily material consisted of 14 parts of oil of almonds and 2 parts of castor oil, thoroughly mixed. To this quantity of mixed oil was added, all at once, 4 parts of the solution of borax as named (each being accurately measured). On being well shaken, a very white uniform emulsion which did not separate resulted. I believe soap is sometimes added to this preparation, to increase its white appearance and to prevent separation; but I do not know that it is a desirable addition, or that it is effectual in preventing separation." I have, up to this period, had no fault to find with my note.

Glycerin Jelly.—This combination may be made opaque or transparent. For the former, soap, glycerin, almond oil, and perfume are used; for the latter, isinglass, gelatin, or transparent soap, 1 oz., dissolved in glycerin and a little added water, this usually being a perfumed water.

GLYCERIN IN THERAPEUTICS.

I hope, by the introduction of a few brief notes under this head, that we shall not be doing any serious injustice to the medical profession.

Glycerin is reputed to be a safe and very effectual emetic for infants. As a substitute for cod-liver oil, iodized glycerin, with iodide of potassium, forms a good tonic, etc., for phthisical patients whose stomachs are unable to bear this oil.

A combination of a fluid extract of *Cascara Sagrada*, glycerin, and a little tincture of nux vomica is highly praised as a tonic laxative. Ferric chloride and its preparations are very astringent, and hence, when taken internally for some time as a tonic, are liable to do harm. This astringent effect is greatly counterbalanced by the addition of glycerin, with which this chalybeate is perfectly compatible. (See, however, a paper by Mr. Schacht, *The Chemist and Druggist*, September 15th, 1882.)

An excellent simple remedy, in place of the old-fashioned rum and figs, for tightness of the chest and the cough of old people, is a mixture of 40 fluid drachms of glycerin, 10 of rum, with 1 minim of oil of anise or peppermint.

The combination, as an aperient, in doses of 1 drachm, of glycerin and castor oil in equal parts, is now so old that it has almost sunk into oblivion, but it is undoubtedly, when prepared *secundum artem* and with a little flavoring agent, a valuable and highly efficacious, elegant preparation. The activity of the oil is said to be increased.

An excellent application for scalds and burns is composed of equal parts of glycerin and oil of peppermint. Glycerin, as an external application, is said not to be absorbed by the skin, hence it is of especial value as a basis when such agents as mercuric chloride, iodoform, etc., have to be superficially applied in cases of certain skin diseases, as scabies, etc. 1½ drachm, dissolved in 3 fl. oz. of glycerin, is reported to possess valuable powers in the treatment of scabies, etc.

Iodized glycerin prevents the pitting which may result after an attack of small-pox. As a liniment, in combination with chloral hydrate, camphor, etc., it receives the commendation of sufferers from rheumatism.

When vaporized in a suitable apparatus, and its fumes inhaled, glycerin is a simple expedient in cases of bronchial affections and distressing coughs; and here we may remark that many eminent vocalists are fully alive to the value of this substance as a voice-strengthener and throat-invigorator.

Salicylate of sodium, dissolved in glycerin, has its medicinal effects greatly enhanced. A good remedy for dyspepsia consists of pepsin, sherry, glycerin, and tartaric acid.

Naphthalin, recommended as an antiseptic agent, with a view to checking diarrhœa, and said to be efficacious in cases of intestinal catarrh, even when chronic, may be administered in glycerin, in which it is soluble when the solvent is slightly warmed. Indirectly connected with glycerin is the use of nitro-glycerin, as a 1-per cent solution in diluted alcohol, for neuralgia, etc.

Mercuric iodide, with glycerin, is a good paint for corns.

An excellent simple febrifuge drink is thus made: Glycerin, ʒi.; citric acid, ʒss.; water, ℥vi. Dose, 1 to 2 tablespoonfuls every hour for an adult.

GLYCERIN IN THE ARTS.

Glycerin is very largely used in the manufacture of printing, stamping, and letterpress inks, as also in the preparation of inks for the numerous forms of "graphs." The following is an example of an indelible stamp ink, taken from the *Pharmaceutical Record:* Sodium bicarbonate, 22; glycerin, 85; gum arabic, 20; nitrate silver, 11; solution of ammonia, 20; Venice turpentine, 10; mix according to art. For ribbon-ink: Concentrated glycerin and alcohol, of each 15; anilin, ½ oz. Blacking of excellent quality can be made by means of a judicious combination of soot, glycerin, oils, etc.

A good "graph" is readily made from Russian glue, 2; water, 1½; glycerin (1.260), 5 parts by weight. As these sometimes go mouldy, we may mention a wrinkle which will prevent the proneness of gelatin to this trouble. It is simply to dissolve a few grains of boracic acid in the glycerin before incorporating with the other materials.

In the process of vulcanizing india-rubber, glycerin is found to be of service. It appears that the india-rubber acquires properties which protect it from oils and fats without interfering with its other properties.

For silvering and gilding glass we find our subject again in request, by reason of its reducing action on the salts of silver and gold, and also because the deposit thus produced is of a brilliant metallic lustre. An ammoniacal solution of nitrate of silver is first prepared, and in it is poured a little solution of caustic potash, and then a few drops of glycerin. It is then ready for immediate use, since reduction begins at once, which process is accelerated if a little ether or alcohol be also added to the mixture. The result is said to be most brilliant when a moderate heat is used, and darkness is said to favor the adhesion of the deposit to the mirror.

A polish for leather is thus made:—Shellac, 200; spirit, 1,000; Marseilles soap, 25; spirit, 25 per cent., to dissolve soap, 375; glycerin, 40; to which is finally added 5 nigrosin in 125 spirit.

Mineral-water manufacturers are now availing themselves of the advantages to be derived from the use of glycerin in the preparation of the liqueurs and flavors, etc., which are much in request as beverages.

Glovers use large quantities of yolks of eggs in certain processes involved in the manufacture of kid gloves. An addition of a few per centums of glycerin is said to be a decided advantage. Glycerin preserves the yolks for a long time.

In the preservation of anatomical and other specimens its value is well established, but a little point will perhaps be useful to bear in mind. About six years ago a friend presented me with a nice specimen of the ripe fruit and fresh leaf, with tendrils, of the *Bryonia dioica* which I placed in a bottle with some glycerin and water, but now, although in good condition as far as preservation goes, I find the berries have become wrinkled and some have collapsed, which, I believe, is probably due to a process of osmosis, the liquid within the fruit being of a different gravity from the preservative fluid. If I had first ascertained the gravity of the juice, and made my glycerin solution of a similar gravity, if such had been possible, I think the shape of the fruit would have been retained.

ARTS.

For the preservation of cider, glycerin of salicylic acid is admirable, a very small quantity keeping it good for over twelve months.

A solution of alum, arsenic, and nitre in glycerin is said to be an admirable preparation for "curing" animals' skins. I have a cat's skin which has been successfully prepared with this combination.

To render corks impervious, soak them several hours in a solution composed of ½ oz. glue or gelatin, ¼ oz. glycerin, and a pint of water heated to 50° C. After such a treatment they are nearly proof against many corrosive liquids, but are more completely so if they are first well dried and then dipped in a mixture of 4 parts of paraffin and 1 of vaseline, or simply ordinary petroleum oil.

NITRO-GLYCERIN.

The easiest and safest method of preparing this explosive is that which was first introduced by Messrs. Boutmy and Foucher, and which as a new and safe method obtained the prize of 2,500f. offered by the French Academy of Sciences. First by converting the glycerin into sulpho-glyceric acid, and in this form bringing it into contact with the nitric acid, to which an equal weight of sulphuric acid has been previously added.

* By Mr. F. H. Alcock. See also NEW REM., 1883, 176.

The details of the process are as follows:

One part by weight of pure glycerin (1.260) is thoroughly mixed with 3 parts of strong sulphuric acid (1.842); there is at once a considerable evolution of heat, and the glycerin is slightly discolored. In a separate vessel a mixture of 3 parts (also by weight) of sulphuric acid and 3 parts of nitric acid (1.4) is made, and both mixtures are then allowed to cool down to about 15° C. The next step is to transfer the two cooled liquids to a tall cylinder, and well stir them together, when a slight rise in temperature (to about 20° or 25°) takes place, followed after the lapse of half an hour or so, by a cloudiness of the acids, due to the separation of minute drops of nitro-glycerin. After standing for about twenty hours the formation of the oil is complete, the whole of it having risen to the surface of the acid mixture; it may then be siphoned off, dissolved in an equal volume of ether, to facilitate its separation, shaken up with successive portions of water until the washings fail to redden blue litmus, and finally heated on a water bath until its weight remains constant. The nitro-glycerin will now be light brown in color, and should have a specific gravity of 1.6, and should detonate readily and powerfully when fired by percussion or by means of a fulminating charge. This substance may be easily recognized by the violent but transitory headache which is experienced on placing an exceedingly small quantity (1-100th of a grain or thereabouts) on the tongue.

In the old processes the nitro-glycerin separates almost instantaneously, and rises in part to the surface, thus rendering washing difficult. In the process above described its formation is gradual and extends over a long period of time.

PHYSICAL AND CHEMICAL USES OF GLYCERIN.

The barometric records made for the *Times* newspaper are from a glycerin barometer. In place of the column of mercury of about 30 inches in length, a tube about 27 feet long is used containing ¾ of a gallon of glycerin colored red with anilin. The great advantage of this fluid is that readings can be taken more accurately, for, when subjected to the weight of the atmosphere, while mercury would move 1-10 inch, the height of the glycerin column would be moved through a space of one inch. One objection has to be provided against, *i. e.*, the hygroscopic nature of glycerin, its power of absorbing water from the air being very great. This is remedied, however, by putting a layer of heavy petroleum oil in the cistern of the barometer. There is a glycerin barometer at the Kew Observatory, which also required for its construction ¾ of a gallon of glycerin, and, in order to obtain the correct height, the tube passes through two rooms, the cistern being in one and the column read off in the one above.

This fluid, on account of its high boiling-point and low freezing-point, is of constant use in scientific experiments.

Carbolic acid is said to be an adulterant of ordinary or wood-tar creasote. The former is well known to be soluble in glycerin (glycerinum acidi carbolici), and on the addition of water forms a clear solution. Creasote forms a nearly clear solution with this liquid when of sp. gr. 1.260, but on dilution with water it separates out again.

When gallic acid is warmed for a long time with glycerin, even at a low temperature, pyrogallol results, and this process is taken advantage of by photographers, who use a combination of glycerin and pyrogallol or pyrogallic acid in some of their operations.

A delicate test for glycerin is to take 2 drops of carbolic acid with 3,000 to 5,000 drops of water, and add 1 drop of solution of ferric chloride; in the absence of glycerin a blue color results, but if it be present the color does not form. If coloring matters or sugar are present in the suspected liquid they must first be removed. To do this calcic hydrate is added to the liquid to be tested, with some powdered marble, and evaporated, and the mass then exhausted with a mixture of alcohol and ether; the alcoholic solution evaporated to remove ether and alcohol, and the residue mixed with water, and the test applied, first neutralizing any alkali, should any be present. This may be available as a qualitative test for the presence of glycerin in beers, wines, beverages, etc.

The value of glycerin jelly for mounting microscopic objects needs only a passing comment; its manipulation is very easy, and well suited to the tyro embarking in the study of histology of animals and plants.

The fact that glycerin when present in a solution often greatly interferes with the usual chemical reactions should always be borne in mind. Thus ferric bromide mixed with glycerin, and then sulphocyanide of potassium added, gives the usual red color, but ether does not remove that color and impart it to itself. Again, if ferric bromide be added to sulphocyanide of potassium, and then ether added, we get all that we expect, but on the addition of glycerin the ether becomes colorless again. Glycerin also removes auric chloride and uranium nitrate from their ethereal solutions; so, too, an ethereal solution of mercuric chloride, when agitated with glycerin, is found to hand over the greater part of its solvend to the latter solvent.

Glycerin has very recently been used in a process for the preparation of chemically pure metallic bismuth. Ordinary commercial bismuth is dissolved in dilute nitric acid, and the solution mixed with water until turbidity begins to appear; then a sufficient quantity of fixed alkali is added in solution to precipitate the bismuth and render the solution alkaline; twice the volume of the alkaline solution used is now added, and glycerin in sufficient quantity stirred in to re-dissolve the precipitate; filter if necessary. The filtrate is now mixed with a solution of pure glucose 1 : 6 or 8) and laid aside for some time in the dark; filter again. The filtrate is now boiled and well stirred, when finally-divided bismuth is deposited, which must be filtered away, washed, and dried as rapidly as possible.—*Chemist and Druggist.*

Anisic Acid, according to Curci, is formed by oxidation of Essence of Anise, and occurs as colorless, prismatic crystals, soluble in alcohol and ether. Anisate of sodium is its most powerful salt. The acid is decidedly antiseptic, and resembles salicylic acid in its antipyretic effects. This authority states that it causes increased arterial tension, has a feeble toxic action; causes epileptoid convulsions in animals when it is injected into the veins in large quantities. In its pure state it is a good dressing for open sores. Its use as an antipyretic in acute inflammatory affections is not followed by unpleasant after effects, as in the use of salicylate of sodium.—*Rev. Ital. di Therap.*

Sulphate of Cinchonamine, derived from *Remijia purdiana*, is said by Sée and Bochefontaine, to be six times as active as sulphate of quinine. It causes, in toxic doses, 1, Gradual enfeeblement of the nervous system, followed by convulsions; 2, Slowing and weakening of the pulse, and, after large doses, complete arrest of the heart's action in systole.

Borax as Standard Alkali in Alkalimetry.

TROPÆOLIN "00," Helianthin, or Orange "3, Poirrier," which are used as indicators for acids, with which they produce a red color, are not affected by even the most concentrated solutions of boric acid. When, therefore, even a trace of mineral acid is added to a concentrated solution of boric acid, containing any of the above indicators, the red tint immediately appears. The same happens when the indicator is added to a solution of borax, and a trace of mineral acid is added.

Borax, therefore, acts precisely like a free alkali in this case, and, since solutions of borax keep indefinitely and without alteration, it is advisable to use a standard solution of this salt for volumetric use in alkimetry. Borax, however, is not very soluble in water; nevertheless, accurate results can be obtained even with these rather dilute solutions.

One liter of *saturated* solution of borax contains:

At	Borax, cryst.	Borax, anhydr.	Corresponding to NaO.
0°	22.73 Gm.	12.02	5.64
4°	26.26 "	13.94	6.55
11°	33.39 "	17.98	8.44
16°	42.78 "	22.62	10.62
20°	57.49 "	33.11	15.55
30°	106.82 "	56.48	26.53

In compounds which contain only calcium and boric acid, an excess of volumetric acid is added, the excess of acid determined by volumetric solution of ammonia, and the boric acid determined by the difference.—*Compt. Rend.*

The Preparation of Carmine.

CARMINE is prepared by comparatively simple processes, yet the beauty of the product depends upon various circumstances which are not generally known, and some of which are even now a secret. Even the temperature of the air, light, the condition of moisture in the air and other climatic variations are known to affect the product.

According to the celebrated method of Madame Cenette, fine carmine is obtained as follows: Shake 1 kilo of best cochineal, in powder, with 75 kilos of boiling distilled water, boil for two hours, then add 25 Gm. of pure nitrate of potassium, and after three minutes, 30 Gm. of acid oxalate (binoxalate) of potassium, boil ten minutes longer, then allow to stand at rest during four hours, and transfer the liquid, after settling, into large, glass dishes, where it remains for three weeks. At the expiration of this time, the mould is removed, the liquid is drawn off, as much as possible, with a pipette, and the deposited carmine is dried in the shade.

According to another process, the cochineal decoction is mixed with soda or potash, afterwards with alum, and the separation of carmine effected by addition of albumen or isinglass. Carmine containing albumen is difficult to reduce to powder, being always somewhat granular, and is chiefly used only by confectioners, as painter's color, and for red ink, while that prepared with isinglass is quite friable and applicable for rouge and other delicate purposes. "Burnt carmine" is obtained by cautiously heating ordinary carmine, in small quantities at a time. It is a dark, purple to violet powder and is distinguished by its remarkable permanence.—L. SEDNA in *Neueste Erf. und Erf.*

The Active Principles of Senna Leaves.

MR. RALPH STOCKMAN, of Edinburgh, in a paper published in the *Pharm. Journ.* (1885, March 14th), first reviews the history of the chemical examination of senna up to the present time, and then gives an account of his own investigations, as follows:

"In my first attempt to isolate cathartic acid, I used as precipitants various salts of lead, lime, copper, and soda, but invariably obtained by these methods a substance which, although strongly purgative, always contained a considerable amount of nitrogen. Finally, baryta was used, and by its use a pure cathartate may be got. The method which was finally adopted was as follows: Senna leaves, exhausted with alcohol, were thoroughly moistened with very dilute sulphuric acid in order to set free the cathartic acid from its salts, and then all the matters soluble in cold or hot alcohol were extracted. The alcoholic solution was then precipitated with hot saturated solution of baryta which was added until it no longer gave a precipitate. The whole was then filtered, the residue well washed, and having been put into a glass vessel, a stream of carbonic acid gas was passed through it for some hours. It was again filtered, and as the CO_2 does not decompose all the cathartate of baryta, the cathartic acid is found partly free in the filtrate, and partly as cathartate of baryta in the residue on the filter.

The latter, after treatment with sulphuric acid and filtering, yields a light-brown colored filtrate, which was repeatedly shaken up with ether to remove the coloring matter arising from a slight decomposition of the cathartic acid. It was then carefully neutralized with lead carbonate or oxide at a very slightly elevated temperature, filtered, and so much alcohol and ether added to the filtrate that a moderate precipitate occurred. After again filtering, the filtrate was treated with very great excess of alcohol and ether, the resulting precipitate of cathartate of lead collected on a filter, washed with alcohol, and dried in vacuo over sulphuric acid. There remains in the alcohol-ether, however, a considerable quantity of cathartic acid, because the neutral cathartate of lead seems during the precipitation to form both a basic and an acid salt, the latter of which is not thrown down.

To obtain the baryta salt, the same method practically is used, barium hydrate being substituted for lead.

The neutral solution, however, is only very slightly precipitated by alcohol-ether, and hence baryta water must be added to it, this greatly facilitating the precipitation.

In the filtrate obtained after treating the original barium precipitate with CO_2, there is also a large amount of cathartic acid which may be recovered by adding acetate of lead, treating the precipitate with sulphuric acid, filtering, and then adding to the filtrate baryta water. The resulting precipitate is then washed, and from it either the lead or barium salt obtained as before. By this method, a large quantity of the cathartic acid is undoubtedly lost, unless the various filtrates and precipitates be reworked; but, after trial of many other methods and modifications of this method, I have found that by it the purest specimens of cathartic acid are obtained. The chief points in it are: (1) that the solutions of the active substance must never be evaporated by, or even exposed to heat, as thereby, whether the solution be acid, alkaline, or neutral, decomposition is certain to ensue. This was proved by a series of special experiments, and (2) the use of H_2S must be avoided, as it was probably from this that the sulphur in Kubby's acid arose.

The salts have the following characteristics. Cathartate of lead is a non-crystalline grayish powder. The neutral salt is readily soluble in water, the basic salt insoluble or nearly so, and on treatment with water, the former splits into an acid and basic salt. The baryta salt behaves in the same way. When in mass, it is almost black in color, but when finely powdered becomes yellowish red.

When quite pure, neither salt contains either nitrogen or sulphur, and hence the presence of these bodies in Kubby's cathartic acid must be attributed to impurities. If the salt be decomposed with sulphuric acid and then filtered, a clear brown solution of the free acid is obtained. The test for its purity consists in agitating it with ether, when the latter should remain quite colorless. It is almost tasteless.

Comparatively few experiments were needed to demonstrate the physiological action of cathartic acid.

Test of Chloral Hydrate.

H. W. SNOW, of Salt Lake City, says that when chloral hydrate in solution is treated with a few drops of a solution made by dissolving one part of pure carbolic acid in twenty parts of water, and rather more than an equal volume of strong sulphuric acid is added, a beautiful pink color is developed. One-tenth of a milligramme of chloral hydrate in a cubic centimeter of water will respond to this test.

When large quantities of chloral hydrate are present, the color developed will be a mahogany. In this case a few drops may be mixed with dilute sulphuric acid, in order to observe the pink coloration. Owing to the strongly corrosive action of sulphuric acid, causing it to char and give colors with a large number of organic bodies, this test may not be distinctive without some precautions. The fact that chloral hydrate sublimes readily upon the application of heat may be taken advantage of in separating it from many of those substances which char or give a color with sulphuric acid alone. A little of the substance to be tested is placed in a watch crystal over which has been inverted another watch glass and the whole heated for a few moments on the water bath; the chloral hydrate sublimes and is condensed in colorless drops of (anhydrous) chloral on the upper crystal and may be washed off with water and the solution tested as above.

The slight brown color which many grades of carbolic acid alone gives with sulphuric acid, must not be misinterpreted.—*Western Druggist.*

Cocaine in Acute Coryza.—Dr. W. S. Payst applies a four-per-cent solution to the interior of the nostrils by means of pledgets of cotton, and says that some permanent relief follows a single application. It will, he thinks, be a remedy *par excellence* for hay-fever. [Dr. F. H. Bosworth, of this city, was among the first to observe the good effects of cocaine used in this manner, and his observations are daily confirmed by numerous observers.—ED. AM. DRUGGIST.]

Accident with Lycopodium.—An account is given in the *Journ. de Pharm. d'Als.-Lorr.* of a curious accident in a Strasburg pharmacy. The apprentice was transferring some lycopodium from one bottle to another, when some of the dust resulting suddenly took fire at a gas-jet near by, with a slight explosion. This startled the youth, who dropped the bottle on the floor; a thick cloud of lycopodium dust arose, and itself took fire with a violent explosion, which shattered the windows and broke a good many bottles. The apprentice escaped with a few slight burns.

On a Crystalline Alkaloid from Pomegranate Root Bark.

CARL JULIUS BENDER reports that his investigations on the constituents of pomegranate root bark have convinced him that it contained, besides two amorphous bases, only *one* crystallizable alkaloid.

An active and pharmaceutically manageable preparation, which the author prefers to call *punicine* (instead of *pelletierine*), is obtained in the fol lowing manner:

The powdered root-bark is mixed with about 25% of its weight of slaked lime, and about 5% of soda solution of spec. grav. 1.160 (or an equivalent amount of any other strength), and enough water, to a soft mass. After twelve hours' standing, during which time it has repeatedly been stirred, the mass is placed upon strainers, allowed to drain, and then pressed. New water is added, and the process repeated until the bark is exhausted. The strained liquid is faintly supersaturated with acetic acid, filtered and evaporated, in a vacuum-apparatus, at temperature not exceeding 30° C. (86° F.).

A sufficient quantity of caustic alkali is now added to set the alkaloid free, and the latter extracted by shaking with chloroform. The chloroformic solution is at once shaken with diluted sulphuric acid. The latter should not be used in excess, not more should be used at any one time than can be saturated by fresh alkaloid produced in subsequent operations on the same day.

The neutral solutions of the alkaloidal sulphate are digested with animal charcoal, filtered, mixed with an excess of bicarbonate of sodium (free from carbonate), and then extracted with chloroform absolutely free from alcohol. The chloroformic solution having been dehydrated by shaking with bicarbonate of sodium, and filtered, the bases are removed by agitation with a mixture made in the proportion of 1 Gm. of sulphuric acid to 10 C.c. of water, without using an excess of acid. This process is repeated once or twice more. The solution finally obtained is spread upon plates of glass, and dried, without heat, by exposure to air. The saline mass is scraped together, dissolved in the least possible quantity of boiling absolute alcohol, and mixed with ether, which causes crystals to form. The mother-liquid, still containing some amorphous sulphate, is removed by a suction filter, the residue washed with a small quantity of alcohol containing ether, finally with pure ether to remove the still adhering liquid, and dried at 30° C. (86° F.).

The dry sulphate is now dissolved in distilled water, treated with animal charcoal, filtered, and evaporated in vacuo, when the salt will remain in form of colorless crystals, permanent in the air. The liquids, from which this alkaloid has been removed by means of bicarbonate of sodium, may be worked for the amorphous bases by adding caustic soda, shaking with chloroform, and saturation with acid. The solution thus obtained, neutralized if necessary, is mixed with the residue of the ethereo-alcoholic menstruum, diluted with distilled water, and alternately mixed with solution of tannic acid and very weak water of ammonia, so that *tannate of punicine* may be obtained, which, when washed, pressed, dried at a gentle heat, and comminuted, forms a yellowish-gray powder. —*Pharm. Centralh.*, 1885, 53.

Bicarbonate of Sodium is said by Behring to unite with iodoform in the body to form an iodide, in which state it is found in the urine. By administering the bicarbonate regularly, tolerance of the iodoform can be secured. —*Courrier Med.* and *N. Y. Med. Jour.*

Action of Metals upon Chloral Hydrate.

S. COTTON has examined the action of metals upon chloral hydrate, and has found that the latter is decomposed more or less energetically according to the temperature, the nature of the metal, and the state of division of the latter.

His published results refer only to zinc and iron, and the following is an abstract:

1. *Sheet Zinc*, in squares of about one centimeter (⅜ inch).

If chloral hydrate, in aqueous solution, is mixed with such pieces of sheet zinc, decomposition begins at once, but with extreme slowness. But at 80° to 100° C., the evolution of gas is more rapid, about 125 C.c. being disengaged from 600 Gm. of zinc and 10 Gm. of chloral. The resulting gas is composed of hydrogen, and contains traces of chlorinated products.

At the same time there is produced a chloride and an oxychloride of zinc; the latter, which is but little soluble, covers the metal and gradually arrests further action. By continued heat, the chloride of zinc formed reacts upon the not yet decomposed chloral, and alters it so as to cause it to assume a brown tint.

2. *Powdered Zinc* causes the reaction to begin at ordinary temperatures, with considerable energy. The mixture at first becomes heated and then cools off again. If the mixture is heated to boiling, the hydrogen gas, which is given off with great rapidity, contains products of the decomposition of chloroform, such as mono- and bichloromethyl.

The question then arises: What takes place when chloral is in contact with nascent hydrogen?

If the hydrogen is in great excess, and an acid stronger than formic prevents the latter from uniting with the metal, the whole of the chlorine is replaced by hydrogen, and aldehyde is regenerated. The same happens when hydrochloric acid and chloral are brought in contact with zinc, as has been demonstrated by J. Personne.

Under the previously mentioned conditions, however, chloral decomposes, and the resulting formic acid unites with the metal, while the chloform, which becomes also formed, is reduced by the nascent hydrogen, and transformed into decomposition products.

Iron.—This metal, except when in powder, acts altogether differently from zinc.

On heating, say one kilogramme of smallest iron-tacks with a solution of 50 Gm. of chloral in 500 Gms. of distilled water, a large proportion of undecomposed chloroform distils over. At the same time, however, another portion of it is reduced just as in the case of zinc.

Iron, in form of powder, disengages from the solution a great deal more hydrogen than when used in larger pieces, and the chloroform, in this case, is altogether reduced at the moment of its formation.

If these processes are made to take place in an apparatus so constructed that the vapors given off are successively conducted through several wash-bottles, then the first of the latter, which must be kept cold, will be found to contain a certain quantity of unaltered chloral, carried over by the heated vapors. The second wash-bottle does not contain a trace of chloroform.—*Rép. de Pharm.*

Antiseptic Silk is made by Dr. Freeman, by boiling Chinese twist for ten minutes in a two-per cent solution of chromic acid, and soaking it for twelve hours in a one-per-cent solution. These sutures cause no suppuration, and the silk does not soften.—*Lancet.*

Solubility of Carbon Disulphide and of Chloroform in Water.

G. CANCEL and F. PARMENTIER, who have already published the results of certain experiments on the subject of the solubility of disulphide of carbon in water, recently completed their report. We take from it the following:

1. *Solubility of Disulphide of Carbon:*

1 liter of water dissolves of CS_2

	Gm.		Gm.
at 0° C.	2.04	at 30° C.	1 55
5° "	1.99	35° "	1.37
10° "	1.94	40° "	1.11
15° "	1.87	45° "	0.70
20° "	1.79	49° "	0.14
25° "	1.69		

2. *Solubility of Chloroform:*

1 liter of water dissolves of $CHCl_3$

	Gm.
at 0° C.	9.87
3.2° "	8.90
17.4° "	7.12
29.4° "	7.05
41.6° "	7.12
54.9° "	7.75

A remarkable fact is here to be noticed. While the solubility of disulphide of carbon decreases uniformly with the increase of temperature, the point of least solubility of chloroform lies near 30° C. (86° F.). The solubility of the latter increases both upward and downward from this point on the thermometric scale, but it is most soluble at the freezing point of water (0° C. = 32° F.).

A clear saturated solution of chloroform made at a temperature of near 30° C. will become turbid neither by cooling nor by heating. One made at 4° C. will become turbid on raising the temperature, from the separation of chloroform, and if made at 59° C. it will become turbid on cooling.

The chloroform which the authors used for their experiment was made from chloral, and had the following specific gravity:

	Gm.
at 0° C.	1.5261
5° "	1.5168
10° "	1.5075
15° "	1.4981
20° "	1.4888
25° "	1.4793
30° "	1.4698
35° "	1.4603

—*Compt. Rend.*, vol. 100, 773.

To discriminate between Butterine and pure Butter.

THIS method enables any one to put it into practice. Having ready two small but wide-mouthed glass test-tubes, about four inches high with feet attached, into one put a piece of butterine or oleo-margarine (about the size of a hazel-nut) and cork this tube; into the other put a similar sized piece of pure butter, and cork that tube; next take one in each hand at the bottom; in ten minutes the butterine melts into a clear oily fluid by the mere heat of the blood (98° F.).

Pure butter takes twice as long to melt as butterine, and even then is not so clear and oily as butterine, which is a noteworthy difference between them; this is the physical test. For the chemical test, after the tubes have stood to cool for a few minutes, pour on ether to about one-third of the tube, and cork well. Agitate the tubes—one in each hand—clasping them well. The butterine readily dissolves into a clear liquor, which the addition thereto of 20 or 30 drops of spirit of wine does not disturb or precipitate; but a similar experiment with pure butter produces a voluminous white precipitate. Hereby we can easily distinguish one from the other. Even butter adulterated with a portion of oleo-margarine or butterine may be detected by a precipitate being formed.—JOHN HORSELEY in *Chem. News*, March 6th.

Anthracene from Water-Gas Tar.

IN a paper read before the late meeting of the Am. Assoc. for the Advancement of Science, Dr. A. E. Elliot read a paper on the above subject, from which we select the following brief portion:

"A little more than a year ago I obtained some of the tar formed during the manufacture of so-called water-gas. The tar is obtained in that part of the process where a mixture of carbonic oxide and hydrogen containing the vapor of petroleum naphtha is passed through red-hot retorts. This proceeding converts the hydrocarbons of the paraffin series into a mixture of ethelyn, acetylen, and members of the aromatic series. It was already known to me that this tar contained naphthalin in very large quantities, and it appeared most probable that other hydrocarbons of the aromatic series were also present, more especially anthracene. Since anthracene is the most valuable of the higher members of the aromatic hydrocarbons, from its use in the production of alizarin, and the day is not far distant when water-gas will be used more extensively, at least in the United States, the value of water-gas tar for the manufacture of anthracene appeared to me of considerable importance. My first efforts were confined to the distillation of the tar, and an examination of that part of the distillate that comes over at 210° to 350° Celsius. This distillate was dissolved in glacial acetic acid and gave a clear solution, which was treated with a mixture of chromic acid dissolved in a mixture of acetic acid and water, according to the well-known method of Lück. After digesting some hours, the mixture was poured into water, and a flocculent precipitate separated. This precipitate, having all the appearance of anthraquinone, was thoroughly washed with water, then with dilute solution of sodii hydrate, and finally with water again. The result of this experiment was that that part of the tar distillate coming over between 210° to 350° contained 5.8 per cent of anthracene.

[Attention had already been directed by G. Bibanoff (Technik III., 31), upon the possibility of producing anthracene from naphtha-residues. This question is of vital importance to Russia, which does not possess an alizarin factory, and is compelled to buy this dye-stuff abroad. The chief obstacle was the impossibility of getting a sufficient supply of anthracene. If this substance, as now appears, can be obtained in reasonable quantities from petroleum, which is so abundant in certain portions of Russia, the home manufacture of alizarin will probably soon become an established fact.—ED. A. D.]

A Harmless Soldering Mixture.—A correspondent of the *Sanitary Engineer* draws attention to the fact that a patent has recently been issued for a harmless liquid to be used in place of chloride of zinc solution for moistening tin-plate to be soldered, particularly in the case of tin-cans containing articles of food. The inventor is C. N. Waite, of Littleton, Mass. It is composition is, equal parts by weight of *lactic acid* and *glycerin*.

Pilocarpine.—Mollière uses a sixth of a grain hypodermically of muriate of pilocarpine in pneumonia, with the effect, he says, of diminishing blood-pressure and relieving cerebral disturbance. He considers the latter to be caused by interference with the renal function and consequent uræmic poisoning. The profuse perspiration following the action of the remedy is calculated to remove the urea from the blood.—*Lyon Méd.* and *N. Y. Med. Jour.*

Explosive Compound.

A BIRMINGHAM correspondent of the *Chemist and Druggist* writes:

"Whilst transacting business with a chemist in the town, I was witness to a most curious and unexpected experiment. A customer came into his shop and asked for three-pennyworth of white arsenic, two-pennyworth of chloride of lime, and two-pennyworth of soft soap. The lime and arsenic to be mixed together, so that half could be used for one room and the remainder for another room, for the purpose of ridding them of fleas. The customer would call again in about ten minutes. The chemist mixed four oz. arsenic and six oz. of lime with an old steel knife on a piece of common paper, labelled it poison, and placed it aside. After a few minutes a slight report, with a violent effervescing noise, was heard in the vicinity of the parcel, and immediately the shop was filled with a dense grayish-white smoke of the most choking and irritating properties, which made us withdraw for a breath of fresh air; as soon as possible a large thick duster was thrown over the parcel, it was carried out to the back, and some water thrown upon it, which at once killed it. It was some minutes before the shop was cleared of smoke, and we were able to stay in it. Text-books are silent on such a mixture. Whether it was a case of chemical affinity or combustion, perhaps some of your analytical competitors may be able to inform us. In mixing a fresh lot, the arsenic was mixed with the soap and the lime put by itself."

Tough Filtering-Paper.

MR. E. E. H. FRANCIS communicated a most interesting paper to the Chemical Society "On Toughened Filter-paper," which, if it fulfils the statement made concerning it, will be a great boon to operators. Filter-paper is recommended to be immersed in nitric acid, sp. gr. 1.42, and to be washed with water. It is then remarkably toughened, the product being pervious to liquids, and quite different to the parchment-paper made by means of sulphuric acid. It can be washed like a piece of linen. So treated it contracts in size, and the ash is diminished, the weight is slightly reduced, and it contains no nitrogen. The toughened paper can be used with the vacuum-pump in ordinary funnels, without extra support, and fits sufficiently close to prevent undue access of air, which is not the case with parchment-paper. An admirable way of preparing filters is also suggested: dip only the apex of the folded paper into nitric acid, and then wash with water; the weak part is thus effectually toughened.—*Chem. and Drugg.*

The Reaction of Fused Chlorate of Potassium.

THE German [and also the U. S.] Pharmacopœia directs that the residue left after igniting chlorate of potassium should have no alkaline reaction [should have a "neutral reaction," U. S.], which is supposed to indicate the original presence of nitrate of potassium.

According to Dr. Vulpius, this test is unsatisfactory, since chlorate of potassium, even if entirely free of nitrate, yielded an alkaline residue. Vulpius draws attention to an observation of Wagner, that oxygen gas prepared from chlorate of potassium often contains chlorine, in which case the residue always had an alkaline reaction; and further, that chlorine was always given out, as long as not every trace of organic substance or of carbonic acid gas was excluded. Yet it is very rare for organic substances to be entirely absent from the salt, and this is, therefore, the cause of the alkalinity of the residue. Vulpius thinks that any chloride of potassium present may lose chlorine at an elevated temperature, and leave an alkaline residue of oxychloride.

Dr. Vulpius recommends to modify the test as follows: Fuse 1 Gm. of the chlorate in a test-tube and continue the heat until it becomes again solid. Let cool and dissolve the residue in 4 C.c. of water with the aid of a gentle heat. 10 drops of this liquid, when added to a mixture of 1 drop of phenolphthalein solution and 2 C.c. of water, should not produce a trace of red color.—*Pharm. Centralb.*

The Active Principles of Ergot.

TANRET, the discoverer of ergotinine, denies the correctness of the results lately obtained by Dr. Kobert in his investigations on the active principles of ergot (of which we gave an abstract in our February number, page 25). This author had announced the discovery of a new alkaloid, to which he gave the name *cornutine*, at least preliminarily. Dr. Kobert claims that Tanret's ergotinine, when *pure*, does not affect the uterus, and possesses oxytocic properties only when contaminated with cornutine. Tanret claims that the method by which Dr. Kobert obtained his cornutine—exposing an acid solution of ergotinine for some time to the air, etc.—resulted simply in obtaining impure ergotinine. He draws attention to the apparent anomaly between the facts that 1st, ergotininine (Tanret's) *does* contract the uterus, and 2d, Dr. Kobert's assertion that "cornutine" itself does *not* produce this effect, but that ergotinine, containing "cornutine" as an impurity, may do so.—After *Journ. de Pharm.* [5], XI., 309.

Estimation of Fragrant Essential Oils.

IF an aqueous or alcoholic solution of bromine is added gradually to an aqueous or alcoholic solution of an essential oil (for example, rose, geranium, neroli, rosewood, bergamot, lemon, orange, lavender, marjoram, cummin, eucalyptus), the color of the bromine solution is discharged up to a certain point, beyond which any further addition of bromine produces a permanent coloration. The end of the reaction is also distinctly marked by the disappearance of the odor of the essential oil, and if the oil and bromine are in aqueous solution, by the sudden appearance of a whitish resinous precipitate. The amount of bromide required is always proportional to the amount of essential oil present, but a correction must be made for the quantity of bromine solution (0.2–0.3) necessary to impart a distinct coloration to the quantity employed (25–30 C.c.).

When an aqueous solution of an essential oil is distilled in a flask connected with a Liebig condenser, the whole of the oil comes over with the first 20–50 C.c. of the distillate, according to the amount of oil present.

The author's method consists in concentrating the essential oil by distillation, titrating the first portion of the distillate with a solution of bromine, standardized by means of a standard solution of the particular essential oil.—A. LEVALLOIS, in *Compt. R.* and *J. Chem. Soc.*

Old and musty ethereal oils may be partially restored by shaking 100 parts of the oil with a mixture of 1 part of permanganate of potash in 8 parts of distilled water. They should be shaken vigorously for a quarter of an hour several times, with intervals of one hour's rest, and afterwards drawn off and washed with warm water.

Chloride of Methyl, used in the form of spray, is recommended by Tenneson in the treatment of neuralgia, articular and muscular rheumatism, pleurisy, acute pneumonia, and tuberculous joint diseases, in all of which pain is at once relieved by the local use of the spray. A prolonged erythema, more or less cutaneous hyperæsthesia, and blistering are some of the minor accidents that may occur, and which are avoidable by not directing the spray upon a single spot for more than five or six seconds at a time.—*Rev. de Méd.* and *N. Y. Med. Jour.*

Boldo and Boldine.—Laborde refers to Dujardin-Beaumetz's experiments, reported in 1874, and speaks of the hypnotic effect of the alkaloid. Five or six grains cause, in the human subject, deep sleep, followed by no unpleasant sensations.—*Union Méd.* and *N. Y. Med. Jour.*

Jacaranda Lancifolia is said by Alfred Wright to be serviceable for gonorrhœa, when given in doses of twenty to thirty minims of fluid extract of the leaves, three or four times daily. It acts promptly in the acute stage, diminishing both the pain and the discharge, and being followed by no unpleasant after-effects.—*Lancet.*

Sulphate of Copper.—Dr. Du Moulin says that salts of copper have a specific action upon strumous affections, and asserts that under their use enlarged glands diminish rapidly in size, and scrofulous eruptions disappear.—*Gaz. Hebdom.—N. Y. Med. Jour.*

Solubility of Mercuric Iodide in Water and in Alcohol.—E. Bourgoin has ascertained that biniodide of mercury is soluble in water at the rate of 4 centigrammes per liter (or: 0.617 grain in 33⅞ fl. oz.), the solubility increasing with the temperature, and also by the addition of alcohol. One liter of alcohol of 80 per cent dissolves 2.857 Gm. (44 grains) of mercuric iodide, and one liter of absolute alcohol dissolves 11.86 Gm. (184 grs.).—*Rép. de Pharm.*

It is said that the preservative and antiseptic action of salicylic acid cannot be relied upon when brought into contact with any liquid substance in wooden vessels or casks. The salicylic acid under these circumstances speedily disappears, being apparently absorbed and decomposed by the wood tissue. When this acid is used as an addition to drinking water or wine, the cask must first be coated with pitch.

Lubricant for Glass Stop Cocks.

DR. SCHONDORFF and S. SMITH recommend as the best lubricant for glass stop-cocks in chemical glass-ware (such as burettes, etc.), a solution of gutta percha in a mineral oil of high boiling point. Such a solution is scarcely attacked even by concentrated sulphuric acid.

Glacial Acetic Acid dissolves almost all protein bodies, especially albumen and fibrin, but not casein. It, of course, destroys warts and corns.

Dilute Phosphoric Acid is a pleasant acid in fevers, and dissolves phosphates in the urine quite as well as the other mineral acids. It is well given in lemonade or syrup of raspberries.

Chinese Bandoline.—Pan-fa is the Chinese name for the shavings of a species of elm (?), fragments of which, soaked in warm water one night, produce a vegetable mucilage or bandoline as useful for dressing, curling, and crimping the hair of the Chinese beauty as is the quince-seed of to-day here.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer. Unless special instructions to the contrary accompany the query, the initials of the correspondent will be quoted at the head of each answer.

When asking for information respecting an unusual or proprietary compound, always accompany the query with all the information you may possess respecting it, and, when it can conveniently be done, send a specimen of the label.

No. 1,480.—**Manganese Ore.**

Warren & Penfield, of Mt. Vernon, Ohio, desire information as to the market value of manganese ore assaying 35 to 40% of metal, and also as to who will buy it.

We have made inquiry, and learn that its value in the neighborhood of New York would hardly warrant the expense of transportation from Ohio, and it has been suggested that Pittsburgh would be the natural market for Ohio ores. Will some reader in that (or other) locality have the kindness to furnish the information asked for? As to the value of the ore, it should be remembered that the pharmacopœia requires black oxide of manganese (or pyrolusite which we presume the ore is) to contain at least 66 per cent of the *pure* oxide. Some qualities contain a great deal more. At the rate of 66 per cent of *pure* oxide, it would contain 43.4 per cent of pure metal. A commercial oxide of this kind can be bought in the market—according to the quantity—for perhaps three to four dollars a cwt.; in larger lots for a great deal less. Our correspondents' sample, according to their own statement, contains less than the lowest amount required by the pharmacopœia, and the limit there given is quite fair and not too high. We therefore do not think it would fetch at any time a price as high as that quoted for the 66 per cent oxide.

No. 1,481.—**Cat's-Eye** (J. E., New Jersey).

The cat's-eye is one of the varieties of sapphire, or stones of the corundum series. It is brought usually from Ceylon. Threads of white asbestos are inclosed within it, and reflect the light in a very peculiar manner. When cut *en cabochon* (or smooth), a white band of light is seen floating in its interior that changes position as the gem is moved before the eye. Louis Dieulafait gives its characteristics as composed mainly of alumina, with a trace of oxide of iron and oxide of copper (more recent authority states it to consist of silex, 95.0; alumina, 1.75; lime, 1.25; oxide of iron, 0.25); gray-green in color, with concentric veins; s. g. 3 to 3.6; 8.5 in the scale of hardness (diamond being 10); doubly refractive; index of refraction, 1.76; dispersive power, 0.033; capable of retaining electricity for several hours, infusible, vitreous and opalescent in lustre, and semi-transparent. In the Imperial cabinet at Vienna there is a "cat's-eye" five inches in length, of a greenish color, which is valued at a fabulous sum.

No. 1,482.—**Aqueous Solution of Bisulphide of Carbon or of Benzin** (M.).

Neither of these liquids is soluble, in more than traces, in water. By the intervention of sulpholeates, however, they may be readily dissolved. We were the first to publish an account of the so-called Polysolve and Polysolve-Preparations introduced by Dr. A. Müller-Jacobs (see AMER. DRUGG., 1884, 22), where you will find a full account of the nature and properties of these compounds. Suffice it to say that 1 part of a sulpholeate or polysolve will mix clear with from 1 to 2 (or even more) parts of benzin or bisulphide of carbon, and, if these liquids are mixed with a little ammonia, they may be diluted with water without separation of the dissolved liquids.

No. 1,483.—**Silk Culture** (F. O. R., Mass.).

See the publications of the Agricultural Department, Washington, D. C. If they are not already in the possession of some one in your vicinity, you can probably obtain them by asking for such as contain the information you wish. "Special Report No. 11" will probably embrace all you desire to know.

No. 1,484.—**Protecting Metallic Vessels from Acids** (J. M. S.).

Unglazed or unenamelled metallic vessels can be protected in various ways, provided the acid is not to be heated in them. One way is to coat them inside with a moderate layer of paraffin, or to line them with asbestos-felt saturated with paraffin. Another is to line them with a single piece of sheet-rubber. When working with hydrofluoric acid—which you specially inquire about—and you do not possess a large flat-bottomed dish of caoutchouc or rubber, you may take any kind of shallow, flat-bottomed vessel, lay into it a piece of sheet-rubber, and pour the acid upon the latter.

No. 1,485.—**Hand Grenade Fire Extinguishers** (R.).

These are dependent for their action principally upon the volume of carbonic acid gas given off when the bottle is broken. Their contents vary, so far as we know. One kind which we have examined contains a sediment of about ¾ inch in depth and a colorless liquid. On opening the vessel cautiously, a certain amount of free carbonic acid gas is given off, but the pressure is not very great. The liquid contains a great amount of chloride of sodium, perhaps partly formed in the bottle by the mutual reaction of hydrochloric acid and carbonate or bicarbonate of sodium. Besides, the liquid contains chloride of ammonium, sulphate of ammonium, and bicarbonate of sodium. There are minute amounts of other substances present, probably only impurities from the ingredients used. The sediment is bicarbonate of sodium (chiefly). In one of the original patents, it is stated that the acid is contained in a separate receptacle, in the stopper, but in the grenade we have examined, this is not the case.

We have read of other constituents which have been found in some of these grenades—for there are several kinds in the market—all of them, we have been told, made under a license from the original patentees; but we have not examined them.

No. 1,486.—**Fracture of Bottles Containing Carbolic Acid** (B.).

Probably every one of our readers will have had experience with bottles of carbolic acid which have been found broken without any apparent cause. Our correspondent asks us for an opinion regarding the phenomenon. We can, however, for the present only give hypothetical views or speculations, as we never examined the question minutely, though we often were troubled by the same inconvenience.

One thing we have noticed, that any original bottle of carbolic acid in which the acid had become liquefied by being placed in a warm position never broke as long as the acid remained liquid. Occasionally, however, one or another of these will become exposed to sufficient cold to cause the contents to crystallize. If the crystallization takes place slowly, and crystalline needles form throughout the liquid uniformly, we can imagine of no reason why the bottles should burst, because the crystals have plenty of time to arrange themselves, and could never exert a sufficient pressure upon the sides or bottom to cause a fracture of the glass. Sometimes, however, one side or a special spot of a bottle is more exposed to cold than an other. In such a case, crystallization will start at this spot. And this will generally take place quite rapidly, the crystals radiating from here in all directions. In fact, the inner surface of the bottle, at this special spot, is the place of growth of the crystals. Now when these crystals are formed—and this usually occurs quite rapidly—they absorb heat from the surrounding liquid, as well as the glass, and cause such a contraction of the latter in *one* spot that the glass frequently gives way. This is the most feasible explanation we can give.

We have, however, known of cases where bottles containing carbolic acid in crystals were exposed to such temperature that at no time any portion of the contents melted. And though every one of them was unbroken in the beginning, some of them nevertheless became fractured after a while. In these cases, the breakage must be due to the inability of the glass to contract evenly in all directions, by the lowering of the temperature, the contained cake of crystals being too rigid to give way under the pressure of the the glass.

If any further facts or explanations can be offered by any of our readers, we shall feel obliged for their communications.

No. 1,487.—**Iodoform** (W.).

As we have already once stated, new processes have been patented during the last year or two, for making iodoform (and also chloroform and bromoform) more economically. The last patent was granted in Germany to the Chem. Fabrik auf Actien (formerly E. Schering) for a process in which these substances are obtained by electrolyzing an alcoholic solution of iodide of potassium, calcium, or sodium. If iodide of potassium is used, a stream of carbonic acid gas must be constantly conducted through the liquid. If either of the two other substances are used, carbonic acid gas is not necessary.

No. 1,488.—**Mending Ruptured Leather-Belting** (J. K.).

One of our correspondents wants to know how he may repair a torn leather-belt which he does not wish to throw away, and into which he cannot put metallic rivets, on account of the polished pulleys.

We have no personal experience in this matter, but have lately seen the following plan recommended:

Soak 100 parts of best glue in cold water. When soft, pour off the excess of water, melt the glue on the water bath, then add 3 parts of glycerin. Prepare the belting by roughening the surfaces to be glued together for as long a distance as possible (not less than about 8 inches), by means of a rasp, then having excluded day-light (or working with non-actinic artificial light), add to the melted glue 3 parts of bichromate of potassium dissolved in just enough boiling water, mix well, and apply the mixture to the roughened surfaces, rubbing it well in. Lay them carefully over each other, and compress them strongly between boards. When dry, run a seam of stitches, as an additional protection, across the ends of the pieces, and, if necessary, also across the centre of the flap.

No. 1,489.—**Extemporaneous Preparation of Mineral Waters** (Ed. W.).

It is not very difficult to devise formulæ for imitating the natural mineral waters, but it must be understood that the imitation is more or less empirical, inasmuch as we can, in many cases, only guess at the manner in which the various acids and bases are combined. Further, each mineral water contains certain constituents, often only in traces, to which no special beneficial action is assigned, and which are considered only as unavoidable, but inert substances. Hence, only the more important constituents are usually put in.

In NEW REMEDIES of 1878 (pp. 313, 347, 371) and 1879 (p. 28), we have given formulæ for the preparation of the most important waters. If you desire to ascertain the composition of any foreign mineral water, the analysis of which has been published previous to 1883, we refer you to the important work: "Heilquellen-Analysen." Von Dr. F. Raspe. 8vo. Dresden, 1883. (The work contains only a few American waters.)

A simple formula for Selters and Pullna water has been given, some time ago, by the *Pharm. Zeitschr. f. Russl.*, namely:

1. *Pullna Water.*—Prepare two liquids, one containing the carbonates, the second, among other ingredients, the acid. The former may be labelled "Pullna (Base)," the latter "Pullna (Acid)."

Pullna (Base):

	Parts.
Sulphate of Sodium	5,760
Bicarbonate of Potassium	154
Bicarbonate of Sodium	2,197
Distilled Water	34,320

Dissolve and filter.

Pullna (Acid):

	Parts.
Calcium Carbonate	80
Magnesium Carbonate	900
Magnesium Sulphate	5,725
Hydrochloric Acid (sp. gr. 1.120)	1,630
Sulphuric Acid (sp. gr. 1.850)	1,413
Distilled water	32,460

Dissolve and filter.

For use, take 100 Gm. (ab. 3 fl. oz.) of each liquid and add to a pint of water.

2. *Selters.*—Prepared in a similar manner.

Selters (Base):

	Parts.
Bicarbonate of Sodium	4
Distilled Water	40

Dissolve and filter.

Selters (Acid):

	Parts.
Diluted Sulphuric Acid (sp. gr. 1.113)	5
Diluted Hydrochloric Acid (sp. gr. 1.040)	1
Distilled Water	40

For use, take two tablespoonfuls of each liquid to a glass of water.

More complicated and more approaching the original is the following:

Selters (Base):

	Parts.
Carbonate of Sodium	142
Chloride of Magnesium	22
Sulphate of Sodium	3
Chloride of Sodium	300
Chloride of Calcium	240
Bicarbonate of Sodium	1,200
Water	5,760

Dissolve and filter.

Selters (Acid):

	Parts.
Diluted Sulphuric Acid (sp. gr. 1.113)	2,700
Diluted Hydrochl. Acid (sp. gr. 1.040)	540
Water	8,640

For use, take 2 tablespoonfuls of the base and 1 tablespoonful of the acid to a glass of water.

No. 1,490.—**Clemens' Solution of Bromide of Arsenic.**

We published the formula of this preparation several times, see NEW REM., 1883, 372 (compare also 209) and AMER. DRUGG., 1884, 37.

As bromide of arsenic can be bought from the manufacturing chemists, we append the formula employing the ready-made salt:

	Parts.
Bromide of Arsenic	13
Distilled Water	620

Mix by trituration, until solution has taken place, then filter.

The resulting solution does *not* contain the bromide of arsenic as such, but contains only hydrobromic and arsenious acids mixed, which are generated by the contact of the salt with water:

$$\underset{\text{arsenic bromide}}{2AsBr_3} + \underset{\text{water}}{3H_2O} = \underset{\text{hydrobromic acid}}{6HBr} + \underset{\text{arsenious acid}}{As_2O_3}$$

The free bromine which is often contained in the bromide of arsenic of the market remains in solution in the liquid, and colors it brown.

As the 633 parts of solution above resulting contain theoretically 13 parts of bromide of arsenic,

$$As + Br_3 = 79.4 + 239.4 = 318.8$$

these 13 parts are equivalent to 4.219 parts of arsenious acid and 9.82 parts of hydrobromic acid. The officinal hydrobromic acid contains 10 parts of the anhydrous acid in 100, and 9.82 is so near to 10, that we are justified in considering the two figures practically identical. Therefore, instead of taking the commerial bromide of arsenic, which is always of uncertain composition, it would be much better, and insure a much more uniform product, to prepare the solution thus:

	Parts.
Arsenious Acid	4.219
Diluted Hydrobromic Acid (U. S. P. 10%)	100.0
Water, enough to make	633

or in apothecaries' weight and measure, and in definite terms:

Arsenious Acid	65 grains.
Hydrobromic Acid, 10%	3 fl. oz. 74 min.
Distilled Water	17 fl. oz. 435 min.

Dissolve, mix and filter.

This latter formula is offered *provisionally*, being deduced theoretically and based on the observed fact that bromide of arsenic (and also iodide of arsenic) decomposes by contact with water, the halogen taking hydrogen and the metal oxygen. The solution, as prepared by the last-named method, should be tested and approved therapeutically, before being dispensed in this manner. As soon as occasion offers, we shall take steps in this direction ourselves.

No. 1,491.—**Work of Reference** (J. E. L.).

This correspondent asks us to recommend a book of reference for druggists, in which may be found the common English names of plants, herbs, roots, etc.

We can recommend, outside of the standard works like the Dispensatories, the following:

C. E. Hobb's "Botanical Hand-Book." 8vo. Boston, 1876.

Wm. Miller. "A Dictionary of English Names of Plants." 8vo. London, 1884.

J. M. Nickell's "Botanical Ready Reference."

You may also frequently find information, which is looked for in vain elsewhere, in Gray's "Supplement to the Pharmac.," edited by Th. Redwood.

No. 1,492.—**Shampoo** (J. W. S.).

A good shampoo, for removing dandruff, etc., from the scalp may be prepared by dissolving borax in water, with or without the addition of a little carbonate of ammonium. Very generally, carbonate of potassium is used by barbers. The proportion of these salts is about ½ oz. to the pint. A stimulating effect may at the same time be produced by the addition of some alcohol or bay rum. We think the following a very good preparation:

Borax	1 oz.
Carbonate Ammonium	½ oz.
Aromatic Spirit of Ammonia	1½ f. oz.
Bay rum	4 f. oz.
Water, to make	1 quart.

Pineapple Syrup.

CUT 5 parts of peeled pineapple into thin slices, put them into a suitable vessel, pour on 5 parts of good white wine, 5 parts of water, and let the whole stand for several days at a moderate temperature. Next make a syrup by heating 30 parts of sugar with 30 parts of water to boiling, skim, add the pineapple mixture, raise quickly to boiling (once or twice), and strain at once, without pressure, through clean flannel. Preserve the syrup in stone jugs or bottles, in the cellar.—*Neueste Erf. und Erf.*

Peach or Apricot Syrup.

CUT 5 parts or peaches or apricots, without kernel, into thin slices, pour on them 5 parts each of good white wine and water, let stand for several days in a moderately warm place, then strain through linen, with gentle pressure. Make a thick syrup from 40 parts of sugar and 30 of water by boiling, add the peach-mixture, quickly raise once more to boiling, and strain through flannel. Transfer the filtrate into stone-jugs or bottles, to be preserved in the cellar. Before closing each bottle, add to its contents $\frac{1}{3^{5}}$ part of peach-essence.—*Neueste Erf. und Erf.*

"Dentifrice."

	Gm.
Oil of Peppermint, "English."	10.0
Oil of Anise	4.0
Oil of Staranise	4.0
Oil of Cinnamon, Ceylon	1.0
Oil of Rose	0.5
Oil of Cloves	2.0
Tincture of Ambergris	2.0
Tincture of Vanilla	10.0
Tincture of Cochineal	25.0
Tincture of Logwood	2.0
Tincture of Orris Root	6.0
Sugar	10.0
Alcohol	1 liter

Digest for 24 hours and filter.

—*Pharm. Zeit.*

Enamelling Casks.

INSTEAD of coating the wood of casks with the enamel, the latter is allowed to form in the wood in the following manner: The cask or vat is in the first place treated with an aqueous solution of an enamel obtained by fusing 100 parts of pure silica with 50 parts of alkali. It is then filled with a solution of aluminium acetate in water, mixed with sulphuric acid in the proportion of 4 : 2 : 1. The solution acts on the enamel which has penetrated into the wood, and produces a neutral enamel of silica within the pores of the wood.—F. G. SPONNAGEL, in *Dingl. Pol. J.* and *J. Chem. Soc.*

Sleeping Potion.—Dr. Victor Audhoui recommends the following:

	Gm.	Gr.
Paraldehyde	2.0	30
Peppermint Water	60.0	2 fl. oz.
Orange-Flower Water	60.0	2 fl. oz.
Syrup of Acacia	25.0	½ fl. oz.

To be taken in one or two doses in the course of a quarter of an hour, at the time when sleep is to be induced. The dose may be reduced to 1 Gm. or raised to 3 or 4 Gms. The above dose acts about the same as an equal quantity of chloral hydrate.—*Journ. de Ph.*

Naphthalin.—Rossbach uses the following formula for administering naphthalin in diarrhœa:

Naphthalin,
White sugar .....āā 75 gr.
Essence of Bergamot. .½ gr.

Divide in 20 powders; 5 to 20 to be taken daily for diarrhœa, especially when due to tuberculosis of the intestine.—*N. Y. Med. Jour.*

A Dublin School of Pharmacy.—The Council of the Pharmaceutical Society of Ireland is contemplating the establishment of a school of pharmacy in Dublin.

Dr. Kristalba, a German chemist, recommends crushed graphite as a useful substitute for sand in the sand bath.

For Good Bold Labels for stock bottles the *Journ. de Ph. d'Als.-Lorr.* recommends a paint made from 10 parts of liquid silicate of soda (soluble glass) and 1 part of common oxide of zinc. Three or four layers of this paint to form the white ground, the letters to be marked on with coal-tar diluted with a little turpentine.

Student: "Why are you running so fast?"
Young Doctor: "I must hasten to a patient."
Student: "Better come with me to the tavern."
Young Doctor: "What! and let my patient get well?"
—*Fliegende Blätter.*

Therapeutic Inutility of Vaseline.—Dr. Mielck, of Hamburg, in the *Monatshefte für praktische Dermatologie*, states that the human skin is impermeable to vaseline, in consequence of which the use of this substance prevents the absorption of such medicaments as are mixed with it for this purpose.

Bath Soap-pads.—One of the great drapery houses of Paris is selling at 4*d.* each little linen bags for baths, described as "Bain savonneux à l'extrait de son," a sort of oatmeal soap bath. The bag contains altogether about half a pound of a perfumed mixture of bran, meal, and powdered soap. On wetting and pressing a good lather is produced, as well as a soft pad for rubbing the body.

Benzoic Acid.—A good pill can be made with five grains and one minim of glycerin. This is a convenient way for giving it in phosphatic deposits.

Calendar of Meetings of State and other Medical Associations.

WITH REFERENCE TO THE FACILITIES OFFERED FOR THE EXHIBITION OF OBJECTS OF INTEREST TO THE MEDICAL PROFESSION.

1. Date of Meeting.
2. Name of Society.
3. Place of next meeting.
4. Number usually in attendance (members and others).
5. Are exhibits made in connection with the meeting?
6. Does the society make provision for such exhibits?
7. Are there any taxes or licenses which apply to non-resident exhibitors?
8. Or to non-residents who sell?
9. Secretary or Chairman of the Committee of Arrangements.

1	2	3	4	5	6	7	8	9
Apr. 14, 15, and 16.. ...	Tennessee State Med. Soc.....	Nashville.....	150	yes	yes	no	no	Dr. C. C. Fite, Nashville.
" 14, 15, 16, and 17...	Alabama State Med. Soc.....	Greenville.....	125	yes	yes	no	no	Dr. J. Thighpen, Greenville.
" 15, 16, and 17.....	Georgia State Med. Soc.....	Savannah	175	yes	no	no	yes	Dr. Wm. Duncan, Savannah
" 16, 17, and 18.....	Mississippi State Med. Soc...	Greenville.....	125	yes	yes	no	no	Dr. S. R. Denn, Greenville.
" 21...	South Carolina State Med. Soc.	Charleston.....	75	yes	no	no	yes	Dr. H. D. Fraser, Charleston
" 21, 22, 23, and 24...	Texas State Med. Soc.....	Houston..	350	yes	yes	no	no	Dr. J. J. Burroughs Houston
" 21, 22, 23, and 24...	Amer. Surg. Assoc	Washington, D. C	100	no	no	no	no	J. S. Billings, Surg. U. S. A., Washington, D. C.
" 21, 22, 23 and 24...	Louisiana State Med. Soc.....	New Orleans.	100	yes	no	no	..	Dr. F. W. Parham, N. Orleans
" 22, 23 and 24.....	Arkansas State Med. Soc.....	Little Rock.....	125	yes	yes	no	no	Dr. L. P. Gibson, Little Rock
" 28.....	Cal. Electic State Med. Soc ...	Oakland	100	yes	no	no	no	Dr. H. M. Logan, San Francisco.
" 28,29, 30 and May 1	Amer. Med. Assoc..... ...	New Orleans, La.....	2,000	yes	no	no	no	Dr. W. H. Watkins, New Orleans.
May 12....	Missouri State Med. Soc..	St. Joseph.....	250	yes	no	no	no	Dr. H. H. Middlecamp, Warrenton.
" 12 and 13.....	Amer. Climatological Assoc...	New York, N. Y.....	40	no	no	no	no	Dr. J. B. Walker, Phila., Pa.
" 12 and 14..... ..	Indiana State Med. Soc.....	Indianapolis.....	500	yes	yes	no	no	Dr. E. S. Elder, Indianapolis
" 19, 20, and 21.....	Illinois State Med. Soc.....	Springfield.....	300	yes	yes	no	no	Dr. B. M. Griffith, Springfield
" 20 and 21....	West Virginia State Med. Soc.	Weston.....	50	yes	no	no	no	Dr. A. A. Kunst, Weston.
" 21.....	N. Carolina State Med. Assoc..	Durham.....						
" 20, 21, and 22.....	Iowa State Med. Soc.....	Cedar Rapids.	250	yes	yes	no	no	Dr. H. Ristine, Cedar Rapids
" 26 and 27....	Wisconsin Homœop. Med. Soc.	Janesville.....	50	yes	no	no	no	Dr. E. W. Beebe, Milwaukee
" 26, 27, and 28.....	Nebraska State Med. Soc.. ..	Grand Island	100	yes	yes	no	no	Dr. Emil Christiansen, Grand Rapids.
" 27 and 28.....	Connecticut State Med. Soc...	Hartford.....	200	yes	no	no	no	Dr. L. B. St. John, Hartford.
" 27, 28, and 29	Pa. State Med. Soc....	Scranton.....	250	yes	no	no	no	Dr. J. F. Ernhart, Scranton.
June —.....	Amer. Laryngological Soc....	Detroit, Mich	30	no	no	no	no	Dr. D. Bryson Delavan, New York, N. Y.
" 2....	Wisconsin State Med. Soc.....	Milwaukee..... ..	100	yes	yes	no	no	Dr. J. T. Reeve, Appleton, Wis.
" 2 and 3.....	Maine State Med. Soc.....	Portland.....	..	..	..	no	no	Dr. C. D. Smith, Portland.
" 3, 4 and 5.....	Ohio State Med. Soc.....	Dayton.....	250	yes	yes	no	no	Dr. J. M. Beaver, Dayton.
" 4 and 5.....	Minnesota State Med. Soc.....	St. Paul.....	125	yes	no	no	no	Dr. D. Leasure, St. Paul.
" 9.....	Delaware State Med. Soc.....	Rehoboth....	75	yes	no	no	no	Dr. G. W. Marshall, Mulford
" 9 and 10..... ..	Mass. State Med. Soc	Boston.....	700	yes	no	no	no	Dr. F. W. Goss, Roxbury, Boston.
" 9 and 10.....	New Jersey State Med. Soc...	Long Branch.....	300	yes	yes	no	no	Dr. S. H. Hunt, Long Branch
" 9, 10 and 11.....	Oregon State Med. Soc.....	Portland.....	50	yes	no	no	no	Dr. E. P. Fraser, Portland.
" 10 and 11....	Michigan State Med. Soc.....	Port Huron.....	150	yes	yes	no	no	Dr. H. R. Mills, Port Huron.
" 11....	R. I. State Med. Soc.....	Providence	100	yes	yes	no	no	Dr. H. S. Olney, Providence.
" 16.....	Colorado State Med. Soc.....	Denver..... ...	100	yes	yes	no	no	Dr. W. E. Wilson, Denver.
" 16 and 17.....	N. H. State Med. Soc.....	Concord.....	125	yes	no	no	no	Dr. W. G. Carter, Concord.
" 17.....	Amer. Neurological Assoc....	New York, N. Y.....	40	no	no	no	no	Dr. G. M. Hammond, New York, N. Y.
" 25 and 26.	Vermont State Med. Soc.....	Bellows Falls.....	100	yes	no	no	no	Dr. E. S. Albee, Bellows Falls
July 14.....	Amer. Otological Assoc... .	... .	25	yes	no	..	..	Dr. J. J. B. Vermyne, New Bedford, Mass.
" 15 and 16.....	Amer. Ophthalmological Soc.	.....	35	no	no	..	..	Dr. O. F. Wadsworth, Boston, Mass.
Sept. —	Virginia State Med. Soc.....	Alleghany Springs.....	125	yes	no	no	yes	Dr. L. B. Edwards, Richmond.
" 8 and 9	N. Y. Homœop. State Med. Soc.	Grove Spring, Keuka Lake.	75	yes	no	no	yes	Dr. J. L. Moffatt, Brooklyn, N. Y.
" 15, 16, and 17.....	Amer. Gynecological Soc.....	Washington, D. C.....	..	no	no	no	no	Dr. F. P. Foster, New York.
Oct. 6.....	Med. Assoc. Dist. of Columbia.	Washington.....	..	no	no	no	no	Dr. L. Tyler, 1206 G st., Washington.
Feb. 2, 3, and 4, 1886....	New York State Med. Soc.....	Albany.....	300	yes	no	no	no	Dr. S. B. Ward, Albany.